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DRAFT SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN NAVAL ACTIVITY PUERTO RICO (DRAFT ACTING AS FINAL)

1/1/2011

BAKER

DRAFT
SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN

For NAVAL ACTIVITY PUERTO RICO CEIBA, PUERTO RICO

Prepared for:

Department of the Navy
NAVFAC SOUTHEAST
North Charleston, South Carolina

Prepared by:

Baker

Michael Baker Jr., Inc.
Moon Township, PA

Contract No. N62470-10-D-3000
DO JM01

January 2011

IQC for A/E Services for Multi-Media Environmental Compliance Engineering Support

DRAFT

SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN

NAVAL ACTIVITY PUERTO RICO
CEIBA, PUERTO RICO

JANUARY 2011

Prepared for:

DEPARTMENT OF THE NAVY
NAVFAC SOUTHEAST
North Charleston, SC

Under:

Contract No. N62470-10-D-3000
DELIVERY ORDER JM01

Prepared by:

MICHAEL BAKER JR., INC.
Moon Township, Pennsylvania

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LIST OF ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
ATG	Automatic Tank Gauge
BOSC	Base Operational Services Contract
BMP	Best Management Practice
CFR	Code of Federal Regulations
CP	Contingency Plan
CP(S)	Cathodic Protection (system)
DOT	U.S. Department of Transportation
DSA	Drum Storage Area
DW	Double Walled
FRP	Fiberglass reinforced plastic
HLCV	High Level Control Valve
LDS	Leak Detection System
MGD	Million gallons per day
NACE	National Association of Corrosion Engineers
NAPR	Naval Activity Puerto Rico
NAVFAC	Naval Facilities Engineering Command
NFPA	National Fire Protection Association
NOSC	Naval On-Scene Coordinator
NOSCDR	Naval On-Scene Commander
NSRR	Naval Station Roosevelt Roads
O&M	Operation & Maintenance
OPA 90	Oil Pollution Act of 1990
OSHA	U.S. Occupational Safety and Health Administration
OWS	Oil Water Separator
POL	Petroleum, Oil, or Lubricant
PST	Petroleum Storage Tank
PR EQB	Puerto Rico Environmental Quality Board
RCRA	Resource Conservation and Recovery Act
RRT	Regional Response Team
SOP	Standard Operating Procedure
SPCC	Spill Prevention, Control, and Countermeasures (plan)
STI	Steel Tank Institute

LIST OF ACRONYMS AND ABBREVIATIONS
(continued)

STMP	Storage Tank Management Plan
UL	Underwriters Laboratory
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
UST	Underground storage tank

1.0 PLAN CERTIFICATION AND MANAGEMENT APPROVAL

1.1 <u>Plan Certification</u>

I hereby certify that I am familiar with the requirements of 40 CFR 112 *Oil Pollution Prevention*, November 13, 2009. My judgments are based on a personal site visit and survey, good engineering practice, and on information provided to me by the facilities (which is assumed to be correct).

This Spill Prevention, Control, and Countermeasures (SPCC) Plan for Naval Activity Puerto Rico (NAPR) has been prepared in accordance with good engineering practice and with the requirements of 40 CFR 112. It is adequate for the facility identified based on the information collected at the time of the site visit. Modifications made to the facility may require changes be made to this report in accordance with 40 CFR requirements. Adherence to the plan is the responsibility of the installation.

Signature: ___________________________________ Date: _______________________

Professional Engineer
Registration No.

1.2 Management Approval

Requirement

The plan must have the full approval of management at a level of authority to commit the necessary resources to fully implement this Plan.

Response

NAPR is concerned about the impact that day-to-day operations have on the environment. Pollution caused by fuel and oil spills can have detrimental effects on the environment if proper steps are not taken to prevent and contain such occurrences.

To address this issue, this installation is dedicated to the prevention of fuel and oil spills. It is the policy of this command to minimize to the maximum extent possible the release of fuel and oil from storage tanks, piping, valves, and transfer areas and provide expeditious and efficient containment and cleanup procedures if spills do occur.

Acknowledgement of Plan Approval

This SPCC Plan has been developed for NAPR to address the issue of spill prevention, response actions, and containment. The plan has been prepared in compliance with all Federal, Commonwealth of Puerto Rico and United States Navy regulatory requirements. It serves as a statement of command policy and intent, as well as a working document for those concerned with the prevention and control of spills.

Signature: ____

Printed Name: ____

Title: ____

Date: ____

1.3 Plan Amendment Requirements

Amendment may be required by the U.S. Environmental Protection Agency (USEPA) under 40 CFR 112.4(a) in the event of:

a) Notwithstanding compliance with §112.3, whenever your facility has discharged more than 1,000 U.S. gallons of oil in a single discharge as described in §112.1(b), or discharged more than 42 U.S. gallons of oil in each of two discharges as described in §112.1(b), occurring within any twelve month period, submit the following information to the Regional Administrator within 60 days from the time the facility becomes subject to this section:

(1) Name of the facility;
(2) Your name;
(3) Location of the facility;
(4) Maximum storage or handling capacity of the facility and normal daily throughput;
(5) Corrective action and countermeasures you have taken, including a description of equipment repairs and replacements;
(6) An adequate description of the facility, including maps, flow diagrams, and topographical maps, as necessary;
(7) The cause of such discharge as described in §112.1(b), including a failure analysis of the system or subsystem in which the failure occurred;
(8) Additional preventive measures you have taken or contemplated to minimize the possibility of recurrence; and
(9) Such other information as the Regional Administrator may reasonably require pertinent to the Plan or discharge.

The copy of the plan actually signed and sealed by the Registered Professional Engineer will be designated the master copy. This master copy will be kept with the Area Program Director, the Public Works Environmental Department and the NAPR Fire Department.

2.0 INTRODUCTION

This is the Spill Prevention, Control, and Countermeasures (SPCC) plan for Naval Activity Puerto Rico (NAPR). This plan deals with Petroleum, Oil, and Lubricants (POL). Hazardous substances are not covered in this plan. It is based on 40 CFR 112 *Oil Pollution Prevention, November, 2009.*

2.1 Quick Reference Guide

A quick reference guide containing pertinent information about NAPR has been provided in Table 2-1.

2.2 Types of SPCC Regulated Tanks

The 40 CFR 112 Oil Pollution Prevention Rule, November, 2009 regulates all bulk oil storage containers (aboveground storage tanks, transformers, equipment, drums, etc.) but has exempted all underground storage tanks (USTs) that are subject to all the technical requirements of 40 CFR 280. For this plan, ASTs and tanks considered ASTs for the purposes of 40 CFR 112:

- Aboveground tanks;
- Subterranean vaulted tanks.
- Bunkered tanks

Some of the above tanks are excluded under 40 CFR 112:

- "Permanently closed" tanks;
- ASTs used to control surges or flow in a pipeline regulated by the Department of Transportation (DOT); and
- Tanks not owned and operated by the host facility.

Industry Standard terminology is used in this plan regarding the position of a tank relative to the natural grade of the earth (Table 2-2). All types of tanks considered to be ASTs for the purposes of 40 CFR 112 are covered, but they are referred to in industry standard terminology to avoid confusion, rather than lumped together as “bulk storage tanks” as 40 CFR 112 does.

2.3 Navigable Waters Potentially Affected

Table 2-3 presents navigable waters that could potentially be affected by the facilities located at NAPR.

2.4 Locations of Plan Copies

A complete master copy (i.e., the copy used to record reviews and amendments) of the SPCC plan shall be kept in the office of the Public Works Environmental Office. The NAPR Fire Department, the Security Office, and the Facility Response Team office shall also hold complete copies.

2.5 Spill History

All reported releases shall be documented and kept with the Master Plan Copy in the Base Public Works Environmental Office. A history of reported releases at NAPR (previously identified as Roosevelt Roads) is documented in Appendix G.

Table 2-1: Quick Reference Guide		
GENERAL INFORMATION		
OWNER		U. S. Navy
INSTALLATION NAME		Naval Activity Puerto Rico
UNIFORM IDENTIFICATION CODE (UIC)		N00389
ADDRESSES	MAILING	PSC 1008, Box 3021, FPO AA 34051-3021, Ceiba, PR 00735
	PHYSICAL (if different)	Ceiba, Puerto Rico 00735
PHONE NUMBERS	24-HR	(787) 865-2000
	DAY	(787) 865-2000
LATITUDE/LONGITUDE (main entrance, or elsewhere if noted)	LAT:	18^{o}13'59" North
	LONG:	65^{o}38'48" West
QUALIFIED INDIVIDUALS	PRIMARY: NAME	Mr. Daniel F. Kalal (Area Program Director)
	PRIMARY: WORK PHONE	(787) 865-4444
	BACKUP: NAME	Next in Charge
	BACKUP: WORK PHONE	
SIC CODE (primary)		9711 (National Security)
REGIONAL AUTHORITIES	NAVFAC EFD	NAVFAC
	EPA REGION	II
	COAST GUARD DISTRICT	7th District

Table 2-2: Tank Terminology

INDUSTRY ACCEPTED TERM	EPA TERM (40 CFR 112)	DEFINITION
Aboveground Tank	Aboveground Tank	Tank entirely above grade (natural or otherwise)
Partially-Buried Tank	Aboveground Tank	Tank whose bottom is below grade (natural or otherwise), but whose top is exposed to the elements above grade
Bunkered Tank	Aboveground Tank	Tank whose bottom is below grade (natural or otherwise), but whose top is covered with earth at or above grade
Subterranean Vaulted Tank	Aboveground Tank	Tank in an underground vault
Underground Tank	Underground Tank	Tank completely buried by earth
Field-Constructed Underground Tank	Underground Tank Deferred By 40 CFR 280	Tank constructed in the field that is entirely below grade (natural or otherwise)
Container	Bulk Storage Container	Any container used to store oil. These containers are used for purposes including, but not limited to, the storage of oil prior to use, while being used, or prior to further distribution in commerce
Bulk Storage	N/A	Systems associated with the Fuels Division of NAPR. This plan shall define all tanks greater than 50,000-gallons as Bulk Storage tanks though there are no currently active Bulk Storage tanks at NAPR.

Table 2-3: Navigable Waters Potentially Affected		
Location	**Name or Type of Waters Affected**	**Distance**
On Installation	Daguao River, Ensenada Honda, Puerca Bay, various unnamed lagoons & mangroves	Immediately adjacent
Adjacent to Installation	Port Medio Munto, Atlantic Ocean, various lagoons & mangroves	Adjacent
Near Installation	Puerto del Rey	2500'

3.0 40 CFR 112.7 SPCC PLAN REQUIREMENTS AND RESPONSES

3.1 General

Requirement
If you are the owner or operator of a facility subject to this part you must prepare a plan in accordance with good engineering practices.

Response
This plan is prepared by a registered Professional Engineer experienced in Spill Control, Prevention, Control, and Countermeasure (SPCC) plan preparation and current industry standards for oil storage and spill prevention. This plan has been reviewed and certified by a Professional Engineer. Refer to Section 1.1 Plan Certification.

3.2 Plan Preparation

Requirement
You must prepare the plan in writing. If you do not follow the sequence specified in this section for the Plan, you must prepare an equivalent Plan acceptable to the Regional Administrator that meets all of the applicable requirements listed in this part, and you must supplement it with a section cross-referencing the location of requirements listed in this part and the equivalent requirements in the other prevention plan.

Response
See all sections of this plan; this SPCC plan follows the general sequence of 40 CFR 112 in order to assure compliance with the regulations.

3.3 Recommendations

Requirement
If the Plan calls for additional facilities or procedures, methods, or equipment not yet fully operational, you must discuss these items in separate paragraphs, and must explain separately the details of installation and operational start-up.

Response
Table 3-1 (Recommendations to Achieve Compliance) summarizes in a general manner the procedures, methods and equipment required for compliance. Additional recommendations are stated throughout this document are required to be implemented for compliance with 40 CFR 112.

3.4 Technical Requirements - 112.7(a)

3.4.1 Requirement 112.7(a)(1)

Include a discussion of your facility's conformance with the requirements listed in this part.

Response
Deficiencies were observed at NAPR with regard to certain sections of the regulations that need to be addressed. The deficiencies identified are noted in various sections of this document along with respective corrective measures and recommendations. Once the corrective measures are implemented, the facility will be in full compliance with

requirements and the intent of the law. It is recommended that all corrective measures identified in this document be implemented as soon as possible.

3.4.2 Requirement 112.7(a)(2)

Comply with all applicable requirements listed in this part. Your Plan may deviate from the requirements in paragraphs (g), (h)(2) and (3), and (i) of this section and the requirements in subparts B and C of this part, except the secondary containment requirements in paragraphs (c) and (h)(1) of this section, and 112.8(c)(2), 112.8(c)(11), 112.9(c)(2), 112.10(c), 112.12(c)(2), 112.12(c)(11), 112.13(c)(2), and 112.14(c), where applicable to a specific facility, if you provide equivalent environmental protection by some other means of spill prevention, control, or countermeasure. Where your Plan does not conform to the applicable requirements in paragraphs (g), (h)(2) and (3), and (i) of this section, or the requirements of subparts B and C of this part, except the secondary containment requirements in paragraphs (c) and (h)(1) of this section, and 112.8(c)(2), 112.8(c)(11), 112.9(c)(2), 112.10(c), 112.12(c)(2), 112.12(c)(11), 112.13(c)(2), and 112.14(c), you must state the reasons for nonconformance in your Plan and describe in detail alternate methods and how you will achieve equivalent environmental protection. If the Regional Administrator determines that the measures described in your Plan do not provide equivalent environmental protection, the Regional Administrator may require that you amend your Plan, following the procedures in 112.4(d) and (e).

Response
Non-conformance with any part of CFR 112.7 and/or the respective Subparts is discussed in the response to that specific requirement in the remainder of this document. In addition, corrective actions and recommendations are also noted. As stated previously, it is recommended that these corrective actions be implemented immediately in order to avoid any potential environmental problems at the facility.

3.4.3 Requirement 112.7(a)(3)

Describe in your Plan the physical layout of the facility and include a facility diagram, which must mark the location and contents of each container. The facility diagram must include completely buried tanks that are otherwise exempted from the requirements of this part under 112.1(d)(4). The facility diagram must also include all transfer stations and connecting pipes.

Response
The physical layout of the facility includes a facility map that identifies the location of Petroleum Storage Tanks (PSTs), currently active oil water separators (OWSs), integrated tank generators, transformers, oil containing electric equipment, and drum storage locations. A site location map and the facility maps are provided in the Appendix B. Site diagrams are included in Appendix H. The information includes, but is not limited to: tank location, tank size, tank contents, flow directions, pipe location if known, and other pertinent site specific information.

NAPR, formerly known as the Naval Station Roosevelt Roads (NSRR), occupies approximately 8,800 acres on the northern side of the east coast of Puerto Rico. The property consists of 3,938 acres of upland property and 4,955 acres of environmentally sensitive areas including wetlands, mangrove, and wildlife habitat. NAPR is no longer an active military installation. Only a few military and civilian personnel currently staff the former Navy Base.

Their primary role is as caretaker, and they are charged with maintaining the current physical and environmental condition of the facility until the property is transferred.

The regional area of NAPR consists of an interrupted, narrow coastal plain with small valleys extending from the Sierra de Luquillo Range. In the immediate area of NAPR, elevations range from sea level to approximately 295 feet. Immediately to the north of the NAPR boundary, the hills rise abruptly to heights of 800 to 1,050 feet above sea level. Relief is low along the shoreline and lagoons and mangrove swamps are common.

The underlying geology of the NAPR area is predominantly volcanic (composed of lava and tuff), as well as sedimentary (rocks derived from discontinuous beds of limestone). These rocks all range in age from early Cretaceous to middle Eocene. The volcanic rocks and inter-bedded limestone have been complexly faulted, folded, metamorphosed, and intruded by dioritic rocks. In addition to the predominant volcanic and sedimentary rock, unconsolidated alluvial and older deposits from the Quaternary period underlie the northwestern and western sectors of the base. The primary geologic formations on and near NAPR are various beach deposits, alluvium, quartz diorite and granodiorite, quartz keratophyre, the Daguao Formation, and the Figuera Lava. The Peña Pobre fault zone traverses NAPR.

Surface Water Drainage

The surface waters that flow across the northeastern plain of Puerto Rico, where NAPR is located, originate on the eastern slopes of the Sierra De Luquillo Mountains. Surface runoff is channeled into various rivers and streams that eventually flow into the Caribbean Sea. The Daguao River and Quebrada Seca Stream (a tributary to Rio Daguao) collect surface waters from the hills immediately north of NAPR and, in periods of heavy rain, flooding on NAPR occurs. The Daguao-Quebrada Seca watershed comprises an area of approximately 7.6 square miles (4,900 acres), and the river falls some 700 feet from its source to sea level.

In the low-lying shore areas, seawater flooding results from storms, wind, and abnormally high tides. The tidal ranges in the NAPR area are small, with a maximum spring range of less than three feet. The tides are semidiurnal and have a usual range of about one-foot in the main harbor of NAPR.

Little information exists concerning the hydrogeology of NAPR. The only known potential sources of groundwater lie in lenticular beds of clay, sand and gravel, and rock fragments, which occur at a depth of less than 30 meters. No wells have been developed on site from these layers. Some wells had been developed upgradient of NAPR in Ceiba, approximately three kilometers from base headquarters, but were abandoned due to high levels of salinity.

The quality of surface waters is variable, reflecting the drainage area through which the water flows. Generally, surface waters have high turbidities and bio-organics (naturally occurring organics, such as decay products of vegetable and animal matter) due to the periodic heavy rains that can easily erode soils from steep slopes, exposed areas and disturbed streambeds. Water from alluvial aquifers along the coast of NAPR is of a calcium bicarbonate type, and has high concentrations of iron and manganese. The source of these minerals is unknown, but they may be derived from buried swamp or lagoon deposits.

Drinking Water

The NAPR potable water treatment plant receives raw water from the Rio Blanco through a 27-inch reinforced concrete pipe that replaced the old, open channel. The intake is located at the foot of the El Yunque Rain Forest. This buried raw water line traverses a distance of 14 miles from the intake to the NAPR boundary. A raw water reservoir is located at the water treatment plant and has a 45 million gallon capacity. Additionally, there are two fire protection storage reservoirs with a total capacity of 520,000 gallons.

NAPR has been served for over 30 years by the present water treatment facility. The plant (Building 88) has a capacity of 4 million gallons per day (MGD). Water flows by gravity into a 45 million-gallon raw water storage basin from which the plant draws its supply at a rate of 1.3 MGD on average. Treatment consists of pre-chlorination, coagulation sedimentation, filtration, and post-chlorination.

3.4.4 Requirement 112.7(a)(3)(i)

You must also address in your plan the type of oil in each container and its storage capacity.

<u>Response</u>
All 40 CFR 112 regulated POL storage tanks (ASTs & USTs), generators, and oil containing electrical equipment are presented in Tables 3-2 through 3-6 of this plan. The tables include data collected and provided to Baker by facility personnel during the site visit.

Though there are a number of tanks on the facility, the majority of the tanks are inactive, decommissioned, or closed in place. There are a total of 33 currently active ASTs located in Table 3-2, 4 active USTs in Table 3-3, and 5 currently active integrated generator ASTs in Table 3-4. The OWSs are being used for wastewater treatment and are not regulated under 40 CFR 112. Table 3-5 includes a list of the OWSs. There are approximately 365 oil-containing electrical transformers and sub stations located in Table 3-6. All oil containing electrical equipment is assumed to be active unless otherwise noted.

3.4.5 Requirement 112.7(a)(3)(ii)

Discharge prevention measures including procedures for routine handling of products (loading, unloading, and facility transfers, etc.).

<u>Response</u>
Discharge prevention measures and Standard Operating Procedures (SOPs) for routine handling of products (loading, unloading and facility transfer) must be developed for all fuel transfer operations. These procedures should be readily available for review by employees and contractors. It is assumed that fuel contractors at the facility have SOPs that are required to be adhered to during fuel loading and unloading operations. A copy of these SOPs should be obtained and reviewed by management and facility personnel to ensure adherence to the specific procedures identified.

All storage tanks shall be equipped with, or will be required to be upgraded with, level gauges and/or high level alarms, and secondary containment structures. In addition, all 40 CFR 112 regulated USTs have or will be upgraded to have spill catchment buckets at the tank fill port. Discharge prevention measures associated with regulated POL tanks are identified in Table 3-7. It is recommended that all upgrades be implemented as quickly as possible.

3.4.6 Requirement 112.7(a)(3)(iii)

Discharge or drainage controls such as secondary containment around containers and other structures, equipment, and procedures for the control of a discharge.

Response

All ASTs are either double walled or single walled with some form of secondary containment. However, this is not the case for electrical transformers. As such, for either electrical transformers or aboveground piping located outside of secondary containment areas and as a form of environmental equivalence, a multifaceted approach will need to be implemented in order to adequately address this requirement:

- An active inspection program must be implemented to identify and correct problems identified with piping systems and electrical transformers. An active inspections program would include at a minimum monthly inspections of related appurtenances.
- A strong contingency plan with a commitment of resources necessary to respond to a spill be implemented in lieu of providing secondary containment for the piping, transformers and other systems.
- Consideration given to removal and/or decommissioning (oil contents removal) of non essential transformers that currently contain oil but are not in service.

The Contingency Plan (CP) identifies the procedures and response actions required by personnel on the facility to be able to report, respond, and cleanup potential spills quickly and effectively. The CP is included in Appendix K.

The SPCC regulated USTs at NAPR relative to secondary containment are compliant. According to site interviews with personnel, all of the currently active USTs are Double Walled (DW). Underground piping without secondary containment associated with these USTs must undergo routine (annual) integrity testing or have a form of leak detection.

3.4.7 Requirement 112.7(a)(3)(iv)

Countermeasures for discharge discovery, response, and cleanup (both the facility's capability and those that might be required of a contractor).

Response

The CP located in Appendix K identifies the discovery, response and cleanup actions required by facility personnel in order for cleanup to occur quickly and effectively.

3.4.8 Requirement 112.7(a)(3)(v)

Provide methods of disposal of recovered materials in accordance with applicable legal requirements.

Response

All waste materials used and/or recovered whether by base personnel or contractors hired by the government in the response and cleanup operations shall be properly disposed in accordance with all local, state and federal regulations. A copy of all disposal manifests shall be kept for a minimum of five years for documentation.

3.4.9 Requirement 112.7(a)(3)(vi)

Contact list and phone numbers for the facility response coordinator, National Response Center, cleanup contractors with whom you have an agreement for response, and all appropriate Federal, State, and local agencies who must be contacted in case of a discharge as described in 112.1(b).

Response
A contact list which includes phone numbers is provided in Table 3-8. The contact list includes all agencies that are required to be contacted in the event an emergency response is required. It is recommended that the facility consider an agreement with a local environmental contractor experienced with oil spills as a safety precaution.

3.4.10 Requirement 112.7(a)(4)

Unless you have submitted a response plan under 112.20, provide information and procedures in your Plan to enable a person reporting a discharge as described in 112.1(b) to relate information on the exact address or location and phone number of the facility; the date and time of the discharge, the type of material discharged; estimates of the total quantity discharged; estimates of the quantity discharged as described in 112.1(b); the source of the discharge; a description of all affected media; the cause of the discharge; any damages or injuries caused by the discharge; actions being used to stop, remove, and mitigate the effects of the discharge; whether an evacuation may be needed; and, the names of individuals and/or organizations who have also been contacted.

Response
In the event of an accidental discharge the Spill Response Notification form identified on Table 3-9 shall be used to report a discharge. The CP also provides additional information regarding response procedures required in the event of an incident.

3.4.11 Requirement 112.7(a)(5)

Unless you have submitted a response plan under 112.20, organize portions of the Plan describing procedures you will use when a discharge occurs in a way that will make them readily usable in an emergency, and include appropriate supporting material as appendices.

Response
The CP included in Appendix K describes the procedures that are to be followed in the event of a discharge. It is important to note that the CP should be reviewed on a regular basis and based on either actual events that occur at the facility or training exercised be enhanced appropriately. This constant improvement process is important and will aid the facility in improving its response efforts.

3.5 Predictions - 112.7(b)

Requirement
Where experience indicates a reasonable potential for equipment failure (such as loading or unloading equipment, tank overflow, rupture, or leakage, or any other equipment known to be a source of a discharge), include in your Plan a prediction of the direction, rate of flow, and total quantity of oil which could be discharged from the facility as a result of each type of major equipment failure.

Response
Information on the potential for equipment failures (such as loading or unloading equipment, tank overflow, rupture, or leakage, or any other equipment known to be a source of a discharge), resulting in a spill or other spill scenarios is provided in SPCC Table 3-10.

3.6 Containment and Diversionary Structures - 112.7(c)

Requirement
Provide appropriate containment and/or diversionary structures or equipment to prevent a discharge as described in 112.1(b). The entire containment system, including walls and floor, must be capable of containing oil and must be constructed so that any discharge from a primary containment system, such as a tank or pipe, will not escape the containment system before cleanup occurs. At a minimum, you must use one of the following prevention systems or its equivalent:

(1) For onshore facilities:

- Dikes, berms, or retaining walls sufficiently impervious to contain oil;
- Curbing;
- Culverting, gutters, or other drainage systems;
- Weirs, booms, or other barriers;
- Spill diversion ponds;
- Retention ponds; or
- Sorbent materials.

(2) For offshore facilities:

- Curbing or drip pans; or
- Sumps and collection systems

Response
All regulated ASTs at NAPR are either double walled or are single walled with a form of secondary containment. Piping, associated appurtenances or electrical transformers located outside of secondary containment are required to be inspected on a regular basis with documentation kept for a minimum of five years. A strong contingency plan will be implemented with a commitment from the facility to provide the necessary resources to respond to a spill. An active inspection program as well as a strong contingency plan together act as an environmental equivalence for existing piping/transformers outside of secondary containment.

There are no offshore facilities at NAPR; therefore the requirements for offshore facilities do not apply.

3.7 Alternatives - 112.7(d)

Requirement
If you determine that the installation of any of the structures or pieces of equipment listed in paragraphs (c) and (h)(1) of this section, and 112.8(c)(2), 112.8(c)(11), 112.9(c)(2), 112.10(c), 112.12(c)(2), 112.12(c)(11), 112.13(c)(2), and 112.14(c) to prevent a discharge as described in 112.1 (b) from any onshore or offshore facility is not practicable, you must clearly explain in your Plan why such measures are not practicable; for bulk storage containers, conduct both periodic integrity testing of the containers and periodic integrity and

leak testing of the valves and piping; and, unless you have submitted a response plan under 112.20, provide in your Plan the following:

- An oil spill contingency plan following the provisions of part 109 of this chapter; and
- A written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful.

Response

The NAPR spill response procedure is discussed in the CP located in Appendix K. The CP's primary purpose is to provide NAPR personnel with sufficient information and direction to be able to respond to potential spills quickly and effectively. S previously noted, it is important to review the CP on a regular basis.

3.8 Inspections, Tests, and Records - 112.7(e)

Requirement

Conduct inspections and tests required by this part in accordance with written procedures that you or the certifying Engineer develops for the facility. You must keep these written procedures and a record of the inspections and tests, signed by the appropriate supervisor or inspector, with the SPCC Plan for a period of three years. Records of inspections and tests kept under usual and customary business practices will suffice for purposes of this paragraph.

Response

Since the majority of the regulations regarding Inspections and Testing, relative to oil storage are related to PSTs, this response is mainly dedicated to tanks storing oils. 40 CFR 112 also covers oil-containing equipment like generators with integral tanks and oil filled electric operational equipment like transformers and electric substations, management of those systems is also necessary.

Performance of both routine inspections and scheduled testing is essential to satisfactory PST management. Both are required by multiple regulations as well as the existing SPCC plan. Although similar, Testing and Inspections are performed in different manners at different time intervals. Generally, the differences can be summarized as follows:

> *Inspections:* Are performed on a frequent schedule and in some cases can be performed by minimally trained base personnel. These mainly involve visual assessments of the tanks or ancillary equipment and the completion of a log or checklist. Steel Tank Institute (STI) does state that certified inspectors are required in certain types of inspections.
>
> *Testing:* Is performed on a longer timeframe and usually involves the use of specialized personnel. Usually testing involves in-depth assessment including data collection using tools or equipment. Testing is often presented in a formal report.

The following sections detail the inspection, testing and record keeping requirements for the systems at NAPR. NAPR has implemented an inspection program to minimize the potential of spills and discharges. Site personnel reported that inspections were being conducted for aboveground storage tanks on a monthly basis. However, it is recommended that a more rigorous and formal program be implemented in order to ensure compliance with the intent of 40 CFR 112. It is also recommended that inspections be conducted on all oil containing electrical operational equipment throughout the facility is included in the inspection program. Records of inspections shall be kept for a minimum period of five years.

3.8.1 Inspections

40 CFR 112 and the Facility's SPCC Plan require routine inspections of PST equipment. Inspections should be integrated in the existing facility maintenance routine as indicated in Table 3-11. Deficiencies detected during routine inspections should be documented and reported to the location manager. The respective manager should inform the Environmental Division. All SPCC regulated storage tanks shall undergo the inspections detailed in this Section. Inspection records shall be signed by an appropriate supervisor or inspector and shall be kept for at least three years. Inspection checklists are provided in Appendix F.

On behalf of the EPA the STI has developed a standard for inspections and testing of non-bulk (shop fabricated) ASTs. It is the intention of this plan that all non-bulk ASTs be inspected per the checklists included in Appendix F of this plan (these are more thorough than the STI SP001-04 checklists) and formally inspected (every 10 years) per the STI SP001-04 standard or another EPA approved equivalent. A copy of the STI standard is included in Appendix D.

The EPA has indicated that vaulted or double-walled ASTs need to have the inner wall inspected as part of routine inspections. This is most easily accomplished by use of interstitial monitoring, but manual inspections of the interstitial space are also adequate. This is documented in EPA memorandum OSWER 9360.8-38 which is included in Appendix E.

Deficiencies identified during field inspections should be corrected through a maintenance program in a timely manner to reduce the risk of a significant spill occurrence. Inspection records and logs are required to be kept maintained. Checklists for these PST inspections are provided in Appendix F. Alternative checklists may be acceptable provided the checklists are compliant with minimum industry standards and have been approved by a manager competent in all the regulations identified in this report.

3.8.1.1 Inspections for Leaks

Certainly the most important of all inspections is that of system leak determination ("is this tank or piping leaking?"). While this can be accomplished in variety of ways the main issue is that personnel must check on a routine basis, either through visual inspection of this system or the associated leak detection system, to see if a system is leaking. Table 3-12 identifies the frequency at which systems must be checked and documented for leaks. Although tank systems that have electronic leak detection systems are listed as having continuous leak detection, the leak detection systems must be monitored monthly for leak detection. Systems with leak detection panels must be monitored once per month and log entries made indicating a negative alarm status. If a positive leak alarm is noted at any time, the system must be taken out of service and the cause for the alarm identified. If the piping cannot be routinely inspected for leaks due to its construction, then the Inspection Schedule in the table is labeled as inadequate.

Inspection of Double Walled ASTs

For compliance with 40 CFR 112 inspection requirements, the EPA has determined that inspection of a double-walled AST must also include inspection of the inner product tank. This is discussed in detail in EPA memorandum OSWER 9360.8-38 which is provided in

Appendix E. This type of inspection can be a manual inspection of the interstitial space, but that is difficult and time consuming. A more effective method of this inspection is the installation of a mechanical or electronic interstitial leak detector. Baker makes the Best Management Practice (BMP) recommendation to upgrade all DW tanks that do not currently have interstitial leak detectors.

Inspection of Underground Piping Associated with ASTs for Leaks

ASTs that have underground piping without any form of leak detection pose a risk to the environment. Baker recommends upgrading these systems as soon as possible. Upgrading can come in the form of the addition of some type of leak detection system for the existing piping or replacing the piping with above ground piping and utilizing routine visual inspection for leak detection. Unless this piping is upgraded as recommended, integrity testing of these systems should be performed as shown in Table 3-13.

3.8.2 Tests

Formal Testing of PST equipment is required by 40 CFR 112. Table 3-13 is a discussion of all recommended testing for Non-Bulk systems. Deficiencies detected during testing must be corrected in accordance with respective industry standards in a timely manner to reduce the risk of a significant spill occurrence.

It is the intention of this plan that oil-filled equipment and drums need not be formally evaluated for integrity and corrosion. All oil-filled equipment is not considered bulk storage, and therefore is not subject to the testing requirements of this part.

3.9 Specific Testing Requirements

The following sections identify specific periodic testing to be performed for PSTs. As an additional management tool, Baker has provided a Tank Database for NAPR (in Microsoft Access format). The intent of this database is that Tank Testing can be tracked and updated routinely to help manage compliance with tank testing requirements. This database is included as a CD provided in Appendix I.

3.9.1 Formal Evaluation of Bulk Cut/Cover Tanks

There are currently no active bulk cut/cover tanks present at NAPR. If any of the existing tanks were made active then they would require a formal internal modified API 653 inspection and integrity testing prior to activation. The modified API 653 internal inspection should be conducted every 10 years and periodic inspections as recommended by the tank inspector.

3.9.2 Formal Assessments of Shop-Fabricated ASTs (STI SP001-04)

One of the most important changes to the revised SPCC regulations (40 CFR 112.7) is the requirement for formal evaluations of shop fabricated ASTs. The Steel Tank Institute (STI) has developed a standard test method based on tank configuration, the STI SP001-04, Fourth Edition can be found in Appendix D. All shop-fabricated tanks less than 5,000 gallons at NAPR are classified as Category 1 tanks and require periodic visual inspections. Tanks greater than 5,000 gallons also require periodic inspections as well as formal external inspections 20 years from date of installation. Table 3-14 presents a schedule for formal evaluations of the shop fabricated ASTs at NAPR utilizing the STI SP001-04 method. The piping associated with these ASTs should also be inspected periodically.

3.9.3 Gauge Calibration and Testing (all PSTs)

Since in many cases gauges (either electronic or mechanical) are the main form of overfill prevention and thus discharge prevention for PSTs, it is critical to make certain all gauges are in good working order on a routine schedule. Annually, all gauges and other liquid level sensing devices such as high level alarms should be assessed and tested to confirm proper working order and calibrated for accuracy. For best management practices, all PSTs should have some type of liquid level gauge. This is discussed in the tables located in Section 4.0.

3.9.4 Corrosion Protection System Testing

Currently all of the active USTs at NAPR are comprised of corrosion resistant materials. There are no known metal USTs in service, however some of the inactive tanks may be of metal construction and would require corrosion protection system testing prior to activation in the event that they were to be put back into service. In addition, all underground piping systems should also be verified.

3.9.5 Integrity Testing of Underground Piping Associated with PSTs

Integrity testing on the piping systems is required on an annual basis for pressurized piping and triennial basis for suction piping. For ASTs with underground piping with no form of leak detection, integrity testing is recommended and should be performed on the same basis as USTs (annual basis for pressurized piping and triennial basis for suction piping).

3.10 Maintenance

The logical outcome of an inspection and testing program is the need for period maintenance of PST systems. Based on the results of the routine inspections, NAPR can expect to have to perform such maintenance items as repainting tanks and piping, replacing blown circuit boards in electronic leak detection system panels, and replacing light bulbs in security lighting. Though it appears that regular maintenance and inspections are being conducted, NAPR does not appear to be keeping adequate maintenance records in readily accessible locations regarding PSTs and associated piping as required by regulations. Maintenance records are important criteria in both the federal and state regulations and improvement in this area is required. The following sections outline the maintenance programs.

3.10.1 Maintenance Program

NAPR appears to have a very informal Maintenance Program established based on the site investigation conducted. It is recommended that a more comprehensive maintenance program be immediately implemented and coordination amongst the various POL storage areas throughout the facility. It is imperative that the routine inspections be performed, documented and records maintained and any discrepancies be immediately corrected. If the preventative maintenance required is beyond the capability of the base operators, then the manager of the respective POL storage location should procure the services of a qualified contractor to perform such repairs.

3.11 Inspections, Testing, and Maintenance of Generator Tanks

Per the requirements of 40 CFR 112, the integrated storage tanks associated with emergency generators greater than 55-gallon capacity are treated the same as PSTs relative to inspections. Therefore, these systems are subject to routine inspections. It does not appear that NAPR is routinely inspecting all generators on an adequate schedule. Since these systems are constructed slightly different than typical ASTs the program as shown in Table 3-11 should be followed.

3.12 Personnel Training and Discharge Prevention Procedures - 112.7(f)

3.12.1 Training - 112.7(f)(1)

Requirement
At a minimum, train your oil-handling personnel in the operation and maintenance of equipment to prevent discharges; discharge procedure protocols; applicable pollution control laws, rules, and regulations; general facility operations; and, the contents of the facility SPCC Plan.

Response
Facility personnel have been instructed in the operations and maintenance of oil pollution prevention equipment and pollution prevention control laws and regulations. In addition, specific training commensurate with job requirements also occurs.

Personnel who work in POL storage affected areas shall be instructed in:

1. SPCC plan contents and procedures to prevent spills
2. Equipment existence, location, equipment operations, storage, transfer
3. Inspection requirements & record requirements
4. Pertinent pollution prevention laws, rules and regulations
5. Occupational Safety and Health Administration (OSHA) , 29 CFR 1910.120
6. OSHA Hazard Communication Standard, 29 CFR 1910.1200
7. OSHA Process Safety Standard, 29 CFR 1910.119
8. Resource Conservation and Recovery Act (RCRA) 40 CFR 265.16
9. RCRA Waste handling/ Emergency Procedures, 40 CFR 262.34
10. Department of Transportation Hazardous Materials Training, 40 CFR 172 Subpart H.

In addition, spill briefings are scheduled for handling personnel at least once a year to ensure an understanding of the NAPR SPCC Plan.

While some personnel have knowledge of the above requirements, further development and education of personnel is required in a number of areas stated above. It is recommended that the facility actively ensure that the above training for personnel occurs as stated and maintain active training records for personnel for a period of five years.

3.12.2 Accountable Personnel - 112.7(f)(2)

Requirement
Designate a person at each applicable facility who is accountable for discharge prevention and who reports to facility management.

Response
NAPR will need to identify and designate persons at each facility location who will be accountable for discharge prevention in order to comply with this requirement.

3.12.3 Annual Discharge Prevention Briefing - 112.7(f)(3)

Requirement
Schedule and conduct discharge prevention briefings for your oil-handling personnel at least once a year to assure adequate understanding of the SPCC Plan for that facility. Such briefings must highlight and describe known discharges as described in 112.1(b) or failures, malfunctioning components, and any recently developed precautionary measures.

Response
NAPR shall implement a more assertive training program to ensure that SPCC training and briefings do occur at the facility. Documentation of such briefings at the facility is required in accordance with the SPCC requirements. As stated in the requirement, this training program must highlight and describe failures, malfunctions and other precautionary measures required. All briefings must be documented and recorded.

3.13 Security - 112.7(g) (Excluding Oil Production Facilities)

3.13.1 Requirement 112.7(g)(1)

Fully fence each facility handling, processing, or storing oil, and lock and/or guard entrance gates when the facility is not in production or is unattended.

Response
NAPR is a restricted access federal facility and there is active security present at access points to the installation as well as active security on patrol 24-hours throughout the facility. Facilities where POL materials are stored are typically fenced and access to these locations is restricted to authorized personnel only. These security features are an adequate form of environmental equivalence.

3.13.2 Requirement 112.7(g)(2)

Ensure that the master flow and drain valves and any other valves permitting direct outward flow of the container's contents to the surface have adequate security measures so that they remain in the closed position when in no operating or non-standby status.

Response
Master flow and drain valves were either locked or in the closed position when in non-operating or stand-by status at the time of the site visit. Further valve security is recommended for containment and diked tanks containing drain valves. These valves should be kept locked to prevent unauthorized discharges.

3.13.3 Requirement 112.7(g)(3)

Lock the starter control on each oil pump in the "*off*" position and locate it at a site accessible only to authorized personnel when the pump is in a non-operating or non-standby status.

Response
The electrical starter controls for pumps are locked when not in use. The controls for fuel transfer are within a control building where the pumps are located. Locations where fuel is dispensed to vehicles have pumps that are locked when not in use.

3.13.4 Requirement 112.7(g)(4)

Securely cap or blank-flange the loading/unloading connections of oil pipelines or facility piping when not in service or when in standby service for an extended time. This security practice also applies to piping that is emptied of liquid content either by draining or by inert gas pressure.

Response
All facility piping associated with the NAPR Fuels Division and has been emptied, pigged, and capped. Several of the ASTs and USTs that are not active have been closed in accordance with 40 CFR 112.2 for ASTs and 40 CFR 280.70(b) for USTs are awaiting removal. It is recommended that the remaining tanks which were identified as Inactive, which have been so for 12 months, be closed out, and/or removed.

3.13.5 Requirement 112.7(g)(5)

Provide facility lighting commensurate with the type and location of the facility that will assist in the:

- Discovery of discharges occurring during hours of darkness, both by operating personnel, if present, and by non-operating personnel (the general public, local police, etc.); and
- Prevention of discharges occurring through acts of vandalism.

Response
All currently active PST locations are currently equipped with lighting adequate for leak detection and additional security.

3.14 Car and Tank Truck Loading/Unloading Rack–112.7(h) (Excluding Offshore Facilities)

3.14.1 Requirement 112.7(h)(l)

Where loading/unloading area drainage does not flow into a catchment basin or treatment facility designed to handle discharges, use a quick drainage system for tank car or tank truck loading and unloading areas. You must design any containment system to hold at least the maximum capacity of any single compartment of a tank car or tank truck loaded or unloaded at the facility.

Response
NAPR does not have a tank truck loading/unloading rack located at the facility.

3.14.2 Requirement 112.7(h)(2)

Provide an interlocked warning light or physical barrier system, warning signs, wheel chocks, or vehicle break interlock system in loading/unloading areas to prevent vehicles from departing before complete disconnection of flexible or fixed oil transfer lines.

Response
All trucks delivering fuel to NAPR are required to use wheel chocks to secure the trucks during transfer and prevent premature departure causing a spill.

3.14.3 Requirement 112.7(h)(3)

Prior to filling and departure of any tank car or tank truck, closely inspect for discharges the lowermost drain and all outlets of such vehicles, and if necessary, ensure that they are tightened, adjusted, or replaced to prevent liquid discharge while in transit.

Response
All tank cars are closely inspected for discharges prior to filling and departure. Delivery personnel are required to fully inspect tankers after delivery of product to NAPR.

3.15 Brittle Fracture Failures - 112.7(i)

Requirement
If a field-constructed aboveground container undergoes a repair, alteration, reconstruction, or a change in service that might affect the risk of a discharge or failure due to brittle fracture or other catastrophe, or has discharged oil or failed due to brittle fracture failure or other catastrophe, evaluate the container for risk of discharge or failure due to brittle fracture or other catastrophe, and as necessary, take appropriate action.

Response
No active field-constructed aboveground containers at risk of brittle fracture failure are currently in use at NAPR.

3.16 State Rules, Regulations, and Guidelines - 112.7(j)

Requirement
In addition to the minimal prevention standards listed under this section, include in your Plan a complete discussion of conformance with the applicable requirements and other effective discharge prevention and containment procedures listed in this part or any applicable more stringent state rules, regulations, and guidelines.

Response
The following regulations present additional regulatory criteria beyond the SPCC requirements that must be met:

- 40 CFR 1910.106; OSHA Personnel training requirements for all employees handling oil.
- National Fire Protection Agency 30; Fire protection for flammable liquids.
- 40 CFR 280; UST Regulations, regulatory requirements for oil containing USTs.

3.17 NAPR-Specific Discharge Prevention and Containment Procedural Requirements

3.17.1 General - 112.8(a)

Requirement
Meet the general requirements for the Plan listed under 40 CFR 112.7 and the specific discharge prevention and containment procedures listed in this section.

Response
The tanks that do not meet the general requirements for the Plan listed under 40 CFR 112.7 are listed in Section 4.0 tables of this plan with required upgrades.

3.17.2 Facility Drainage - 112.8(b)

3.17.2.1 Requirement 112.8(b)(l)

Restrain drainage from diked storage areas by valves to prevent a discharge into the drainage system or facility effluent treatment system, except where facility systems are designed to control such discharge. You may empty diked areas by pumps or ejectors; however, you must manually activate these pumps or ejectors and must inspect the condition of the accumulation before starting, to ensure no oil will be discharged.

Response
All diked storage areas containing liquid shall be inspected prior to discharge to confirm that no visible sheen is present. If a visible sheen is present or other evidence exists to suspect that oil/water may be present than the oil/water mixture must be disposed in accordance with applicable local, state and federal regulation. Control of discharge from all diked areas is through manually controlled valves. All valves shall remain in a closed and locked position at all times. A checklist that must be followed as a procedure prior to discharge of a diked storage area is located in Appendix F. As previously stated, a copy of all inspection forms including manifests if required must be maintained for documentation for a period of five (5) years.

3.17.2.2 Requirement 112.8(b)(2)

Use valves of manual, open-and-closed design, for the drainage of diked areas. You may not use flapper-type drain valves to drain diked areas. If your facility drainage drains directly into a watercourse and not into an on-site wastewater treatment plant, you must inspect and may drain uncontaminated retained storm water, as provided in paragraphs (c)(3)(ii), (iii), and (iv) of this section.

Response
All diked storage areas will be inspected prior to discharge. A checklist that must be followed as a procedure prior to discharge of diked storage area is located in Appendix F. A copy of this inspection must be maintained for documentation. Control of discharge of all the diked areas are through manually controlled valves. All valves are manual, open - and - closed design; there are no flapper type valves currently in use at NAPR. These valves shall remain in a closed and locked position at all times.

3.17.2.3 Requirement 112.8(b)(3)

Design facility drainage systems from undiked areas with a potential for a discharge (such as where piping is located outside containment walls or where tank truck discharges may occur outside the loading area) to flow into ponds, lagoons, or catchment basins designed to retain oil or return it to the facility. You must not locate catchment basins in areas subject to periodic flooding.

Response
As a form of environmental equivalence to the above requirement, NAPR will use a multifaceted approach to prevent discharges to the environment for piping located outside of containment walls. An aggressive inspection program, including monthly inspections of the piping will be performed and documented as described in Section 3.8 of this plan. Spill kits shall be at all locations where fuel transfer activities occur, and a strong contingency plan shall be implemented with a commitment of resources necessary to respond to a spill in an expeditious and safe manner.

At truck loading/unloading locations where secondary containment is not addressed, the location and/or the delivery truck shall have spill kits immediately available. These spill kits shall be of sufficient quantity to address the specific nature of a potential spill.

In addition to the above, NAPR has a marina that is used for recreational purposes. The fueling of small boats occurs on water. It is critical that all fueling operation be contained to one location and that this location is boomed prior to fueling operations commencing. This would significantly reduce the potential of fuel spillage spreading out to an area beyond the boomed area. In addition, while the fueling operation is occurring, two personnel should be present with one person at the dispenser and the other at the nozzle fueling the boat and monitoring the fueling operation.

3.17.2.4 Requirement 112.8(b)(4)

If facility drainage is not engineered as in paragraph (b)(3) of this section, equip the final discharge of all ditches inside the facility with a diversion system that would, in the event of an uncontrolled discharge, retain oil in the facility.

Response
All locations with reasonable potential for discharge are contained to reduce the potential of a discharge to the environment.

3.17.2.5 Requirement 112.8(b)(5)

Where drainage waters are treated in more than one treatment unit and such treatment is continuous, and pump transfer is needed, provide two "lift" pumps and permanently install at least one of the pumps. Whatever techniques you use, you must engineer facility drainage systems to prevent a discharge as described in 112.7(b) in case there is an equipment failure or human error at the facility.

Response
This requirement does not apply to NAPR since no treatment of drained waters is performed.

3.17.3 Bulk Storage Containers - 112.8(c)

3.17.3.1 Physical Construction - 112.8(c)(l)

Requirement
Not use a container for the storage of oil unless its material and construction are compatible with the material stored and conditions of storage such as pressure and temperature.

Response
All storage containers present at NAPR are specifically designed for the intended use of oil storage.

3.17.3.2 Secondary Containment - 112.8(c)(2)

Requirement
Construct all bulk storage container installations so that you provide a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation. You must ensure that diked areas are sufficiently impervious to contain discharged oil. Dikes, containment curbs, and pits are commonly employed for this purpose. You may also use an alternative system consisting of a drainage trench enclosure that must be arranged so that any discharge will terminate and be safely confined in a facility catchment basin or holding pond.

Response
All regulated ASTs at NAPR are either double walled or are single walled with secondary containment.

3.17.3.3 Containment Discharge - 112.8(c)(3)

Requirement
Not allow drainage of uncontaminated rainwater from the diked area into a storm drain or discharge of an effluent into an open watercourse, lake, or pond, bypassing the facility treatment system unless you:

- Normally keep the bypass valve sealed closed;
- Inspect the retained rainwater to ensure that its presence will not cause a discharge as described in 112.1(b);
- Open the bypass valve and reseal it following drainage under responsible supervision; and
- Keep adequate records of such events, for example, any records required under permits issued in accordance with 122.41(j)(2) and 122.41(m)(3) of this chapter.

Response
Draining of containment areas by a normally sealed closed valve shall only be performed by trained personnel, which will ensure only uncontaminated water is released as defined in 40 CFR 112. Records of all containment discharge shall be kept and maintained at the general site location by the manager. In addition, a copy shall be provided to the environmental department for review and documentation.

3.17.4 Buried Metal Storage Tanks

3.17.4.1 Requirement 112.8(c)(4)

Protect any completely buried metallic storage tank installed on or after January 10, 1974 from corrosion by coatings or cathodic protection compatible with local soil conditions. You must regularly leak test such completely buried metallic storage tanks.

Response
All of the USTs located at NAPR are double wall fiberglass reinforced plastic (FRP) in construction. There are no known metallic USTs at the facility.

3.17.4.2 Requirement 112.8(c)(5)

Not use partially buried or bunkered metallic tanks for the storage of oil, unless you protect the buried section of the tank from corrosion. You must protect partially buried and bunkered tanks from corrosion by coatings or cathodic protection compatible with local soil conditions.

Response
There are no currently active partially buried and/or bunkered tanks at NAPR. All of the partially buried and bunkered tanks are inactive and have been cleaned.

3.17.5 Integrity Evaluations

3.17.5.1 Requirement 112.8(c)(6)

Test each aboveground container for integrity on a regular schedule, and whenever you make material repairs. The frequency and type of testing must take into account container size and design (such as floating roof, skid-mounted, elevated, or partially buried). You must combine visual inspection with another testing technique such as hydrostatic testing, radiographic testing, ultrasonic testing, acoustic emissions testing, or another system of non-destructive shell testing. You must keep comparison records and you must also inspect the container's supports and foundations. In addition, you must frequently inspect the outside of the container for signs of deterioration, discharges or accumulation of oil inside diked areas. Records of inspections and tests kept under usual and customary business practices will suffice for purposes of this paragraph.

Response
All aboveground storage tanks shall be formally tested for integrity on a regular schedule as detailed in Section 3.8 of this plan and presented in Table 3-13. In addition, any material repairs will also require a formal integrity test. The schedule for these inspections is presented in Section 3.8 of this plan and presented in Table 3-11 and 3-12. Records of these inspections shall be maintained at each tank facility location as required by 40 CFR 112.

3.17.5.2 Requirement 112.8(c)(7)

Control leakage through defective internal heating coils by monitoring the steam return and exhaust lines for contamination from internal heating coils that discharge into an open watercourse, or pass the steam return or exhaust lines through a settling tank, skimmer, or other separation or retention system.

Response
This does not apply to NAPR since no tanks have internal heating coils.

3.17.6 Engineering Controls - 112.8(c)(8)

Requirement
Engineer or update each container installation in accordance with good engineering practice to avoid discharges. You must provide at least one of the following devices:

- High liquid level alarms with an audible or visual signal at a constantly attended operation or surveillance station. In smaller facilities an audible air vent may suffice;
- High liquid level pump cutoff devices set to stop flow at a predetermined container content level;
- Direct audible or code signal communication between the container gauge and the pumping station; or
- A fast response system for determining the liquid level of each bulk storage container such as digital computers, telepulse, or direct vision gauges. If you use this alternative, a person must be present to monitor gauges and the overall filling of bulk storage containers.

You must regularly test liquid level sensing devices to ensure proper operation.

Response
Many storage tanks are equipped with (or must be equipped with) direct-reading visual gauges (constantly attended operation or surveillance station) or a high-level alarm type devices designed to prevent overfills. PSTs requiring upgrading with these systems are discussed in the tables in Section 4.0 of this plan and Tables 4-1 and Table 4-2. All level gauges and high level alarms should be calibrated annually.

3.17.7 Visual Observations

3.17.7.1 Requirement 112.8(c)(9)

Observe effluent treatment facilities frequently enough to detect possible system upsets that could cause a discharge as described in 112.1(b).

Response
There are no effluent treatment facilities on the base.

3.17.7.2 Requirement 112.8(c)(10)

Promptly correct visible discharges which result in a loss of oil from the container, including but not limited to seams, gaskets, piping, pumps, valves, rivets, and bolts. You must promptly remove any accumulations of oil in diked areas.

Response
Discharges of any quantity of oil from its container, seams, gaskets, piping, valves or bolts shall be promptly removed from any containment area. Waste material generated shall be disposed of in accordance with all local, commonwealth, and federal regulations. The procedure to be followed with regard to any discharge of any quantity can be found in the CP

attached as Appendix K. This document goes into great depth with regard to appropriate actions and procedures that will be required in the event of a spill.

3.17.8 Mobile Equipment - 112.8(c)(l1)

Requirement
Position or locate mobile or portable oil storage containers to prevent a discharge as described in 112.1(b). You must furnish a secondary means of containment, such as a dike or catchment basin, sufficient to contain the capacity of the largest single compartment or container with sufficient freeboard to contain precipitation.

Response
There are a 4 mobile refueling trucks remaining at NAPR, though it is unclear whether or not any of these are currently in use for base operations. They were empty during the site visits, and there was no indication from site personnel that any of them had been recently used. These trucks are staged in a containment area large enough to contain the worst case discharge of the single largest container with sufficient freeboard to contain precipitation.

3.18 Facility Transfer Operations, Pumping, & Facility Process - 112.8(d)

3.18.1 Requirement 112.8(d)(l)

Provide buried piping that is installed or replaced on or after August 16, 2002, with a protective wrapping and coating. You must also cathodically protect such buried piping installations or otherwise satisfy the corrosion protection standards for piping in part 280 of this chapter or a State program approved under part 281 of this chapter. If a section of buried line is exposed for any reason, you must carefully inspect it for deterioration. If you find corrosion damage, you must undertake additional examination and corrective action as indicated by the magnitude of the damage.

Response
All new buried piping and piping must have adequate cathodic protection as required by federal and state regulations. Engineering site plan drawings and as-built records shall be maintained at the respective department where such construction activity occurred.

3.18.2 Requirement 112.8(d)(2)

Cap or blank-flange the terminal connection at the transfer point and mark it as to origin when piping is not in service or is in standby service for an extended time.

Response
All required piping will be inspected by the facility and properly capped/blind flanged when not in service in accordance with the requirement.

3.18.3 Requirement 112.8(d)(3)

Properly design pipe supports to minimize abrasion and corrosion and allow for expansion and contraction.

Response
All piping supports are designed for the purpose of supporting the pipes to minimize abrasion and corrosion as well as allow for expansion and contraction.

3.18.4 Requirement 112.8(d)(4)

Regularly inspect all aboveground valves, piping, and appurtenances. During the inspection you must assess the general condition of items, such as flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces. You must also conduct integrity and leak testing of buried piping at the time of installation, modification, construction, relocation, or replacement.

Response
All PSTs including the associated appurtenances will be inspected as described in this section of the SPCC plan. All buried piping will be subject to leak testing (pneumatic or similar) upon completion of any installation, modification, construction, relocation or replacement and prior to going into service.

3.18.5 Requirement 112.8(d)(5)

Warn all vehicles entering the facility to be sure that no vehicle will endanger aboveground piping or other oil transfer operations.

Response
Only properly trained and authorized personnel shall have access to tank facilities.

Table 3-1: Recommendations to Achieve Compliance	
TOPIC	**RECOMMENDATION**
Inactive/Closed Tanks	• Many of the tanks at NAPR are not currently in use or have not been in use for the last 12 months. These tanks should be permanently closed and/or removed from the facility in accordance with appropriate regulatory requirements. • Underground Storage Tanks (USTs) which have not been active within the last 12 months are required to be removed in accordance with appropriate regulatory requirements • Inactive and Closed Tanks that are not going to be removed with approval from appropriate regulatory agencies should be confirmed empty and/or tested to verify integrity. Tanks that are inactive, closed, or decommissioned should be appropriately identified in the field.
Inspections	• All ASTs, containment areas, transformers (and other oil containing equipment) must be regularly inspected and records maintained for a minimum of 5 years. • Visual external inspections for Aboveground Storage Tanks (ASTs), Transformers (and oil containing equipment), and aboveground piping must be conducted monthly and documented with records kept for a minimum of 5 years. • Conduct monthly inspections of Double Walled (DW) interstitial space. This can most easily be done with electronic or mechanical monitoring of the interstitial space, but manual gauging is also acceptable. • Annual spill bucket testing on all UST is required • Monthly inspection of fueling hoses at fuel dispensing locations (Marina and Building 124)
Training Personnel	• All personnel operating and/or maintaining equipment to prevent discharges of oil must be properly trained and relevant training exercises (i.e. potential spill scenarios) must be conducted annually. • SPCC Plan training conducted annually to include: discharge prevention, pollution control laws and regulations and the contents of the SPCC Plan. • Refer to Section 3.12 of this plan for additional information regarding training.
Availability of spill response materials	• Spill response materials (i.e., absorbent materials, gloves, respirators, ect) must be readily available at each facility with POL storage. This material must be inventoried and maintained in good working order in order to insure that adequate supplies are available and in good working order as required.
Tanks and Piping	• All storage tanks must be properly labeled with industry standard markings to include at a minimum fuel type and capacity. • Visual inspections of aboveground piping are required monthly. • Annual testing of underground piping must be conducted. All piping installed after August 16, 2002 must be wrapped, coated, and protected per the standards of 40 CFR 280.
Oil Water Separators	• All field constructed Oil Water Separators (OWS) should be replaced if they cannot achieve adequate leak detection, overfill prevention, and secondary containment. All aboveground OWS should meet the requirements of ASTs such as secondary containment and overfill prevention
Record Keeping	• Inspection records, integrity evaluations, training records, repairs to tanks, and other relevant SPCC information should be maintained for a minimum of five (5) years.
Additional Procedures	• Confirmation that procedures for the proper documentation of all testing and inspections for Petroleum Storage Tanks (PSTs) are conducted and maintained. • Discharge prevention measures and procedures for routine handling of products (loading, unloading and facility transfer) is implemented. • Confirmation that a strong contingency plan is implemented and updated as required based on spill training scenarios. • Confirm identity of personnel where a PST is located who will be responsible for PST inspections, testing, and record keeping. • Potential increase in security to reduce vandalism and potential accidental spill or injuries. • Ensure that at least two personnel are present at fueling operations at marina such that the dispenser can be immediately shut off in the event of overfilling or spillage.
Additional Equipment	• The installation of outside lighting to prevent vandalism. • Confirm that spill kits at all fuel transfer locations as a contingency and a form of general secondary containment • Confirm that spill kits are in all vehicles used for fuel transfer operations. • Wheel chocks are available for fueling operation to prevent accidental movement of vehicles • Ensure that fueling operations at marina are completed only after completely booming the boat to reduce fuel oil spillage beyond immediate area. • Rehabilitate expansion/contraction joint fill at the marina secondary containment storage area to ensure that containment is impermeable to oil spillage

Table 3-2: Regulated ASTs (40 CFR 112)							
Tank ID	**Status**	**Tank Type**	**Capacity (gallons)**	**Contents**	**Nearest Building**	**Installation Year**	**Construction Type**
1080	Inactive	AST Bunkered	1165000	DFM	1982	1968	SW
1082	Inactive	AST Bunkered	1165000	DFM	1982	1968	SW
1084	Inactive	AST Bunkered	1181000	JP-5	1982	1968	SW
1086	Inactive	AST Bunkered	1181000	JP-5	1982	1968	SW
1088	Inactive	AST Bunkered	425000	JP-5	1987	1968	SW
1090A	Active	AST	3000	Gasoline	2334	2004	DW
1090B	Active	AST	2000	Diesel	2334	2004	DW
1205	Active	AST	1000	Diesel	1205	1999	DW
1207	Active	AST	500	Diesel	1207	1998	SW
1211	Closed	AST	5000	Diesel	1211	2001	DW
1211A	Closed	AST	500	Diesel	1211	1997	DW
1211B	Closed	AST	500	Mogas	1211	1997	DW
161	Closed	AST	500	Diesel	161	1999	DW
1691	Active	AST	1000	Diesel	1691	1994	DW
1729	Closed	AST	2000	Diesel	1729	1997	DW
1758	Active	AST	500	Diesel	2019	1970	SW
1796A	Closed	AST	250	Diesel	1796	1997	DW
1796B	Closed	AST	500	Diesel	1796	Unknown	DW
1817 A	Active	AST	5000	Diesel	1817	1997	DW
1817 B	Active	AST	5000	Diesel	1817	1997	DW
1920	Active	AST	500	Diesel	1920	1999	DW
1972	Closed	AST	250	Diesel	1972	1997	DW
2017	Active	AST	500	Diesel	2017	2004	DW
2020	Active	AST	500	Diesel	2020	2004	DW
2021	Active	AST	500	Diesel	2021	1982	SW
2021 M	Closed	AST	5000	Methanol	2021	Unknown	DW
212	Inactive	AST Bunkered	50000	Diesel	N/A	1940	SW
213	Inactive	AST Bunkered	50000	Mogas	N/A	1940	SW
214	Inactive	AST Bunkered	248000	DFM	N/A	1940	SW
215	Inactive	AST Bunkered	245000	DFM	N/A	1940	SW
216	Inactive	AST Bunkered	247000	DFM	N/A	1940	SW
217	Inactive	AST Bunkered	245000	DFM	N/A	1940	SW

Table 3-2: Regulated ASTs (40 CFR 112)							
Tank ID	**Status**	**Tank Type**	**Capacity (gallons)**	**Contents**	**Nearest Building**	**Installation Year**	**Construction Type**
2248	Active	AST	5000	Diesel	2248	1989	SW
2303-2	Active	AST	500	Diesel	2303	Unknown	SW
2357	Closed	AST	1000	Diesel	2357	1999	DW
2360	Active	AST	500	Diesel	2360	1999	DW
2361	Active	AST	500	Diesel	2361	1999	DW
2406	Active	AST	500	Diesel	2406	Unknown	SW
2407	Closed	AST	1000	Diesel	2407	Unknown	SW
2426	Active	AST	500	Diesel	2426	Unknown	SW
296	Closed	AST	500	Diesel	296	1999	DW
31B	Closed	AST	1000	Used Oil	31	1943	SW
31F	Closed	AST	1000	Diesel	31	1955	SW
381	Inactive	Bunkered AST	1180000	JP-5	N/A	1999	SW
500	Closed	AST	1000	Diesel	500	1982	DW
542	Active	AST	500	Diesel	542/2016	1996	SW
56C	Closed	AST	5000	Used Oil	1982	1996	SW
729	Closed	AST	1000	Diesel	729	1996	DW
731	Closed	AST	1000	Diesel	731	1996	DW
732	Closed	AST	1000	Diesel	732	1996	DW
733	Closed	AST	1000	Diesel	733	1996	DW
734	Closed	AST	1000	Diesel	734	1996	DW
737	Active	AST	1000	Diesel	737	Unknown	SW
784	Active	AST	150	Diesel	784	Unknown	SW
798	Active	AST	500	Diesel	798	1999	DW
82	Inactive	Bunkered AST	2115000	DFM	N/A	1940	SW
83	Inactive	Bunkered AST	1157000	DFM	1982	1940	SW
84	Inactive	Bunkered AST	585000	JP-5	1982	1944	SW
85	Inactive	Bunkered AST	1134000	JP-5	1982	1944	SW
88	Active	AST	500	Diesel	88	1998	DW
PRT	Active	AST	500	Diesel	737	2008	DW

Table 3-3: Regulated USTs (40 CFR 112)								
Tank ID	**Tank Type**	**Status**	**Capacity (gallons)**	**Contents**	**Nearest Building**	**Installation Year**	**Construction Type**	**Tank Construction Material**
124A	UST	Active	2500	Diesel	124	1996	DW	FRP
124B	UST	Active	6000	Gasoline	124	1996	DW	FRP
124C	UST	Active	6000	Gasoline	124	1996	DW	FRP
1686	UST	Closed	10000	JP-5 Fuel	1686	1996	DW	FRP
1982	UST	Closed	550	Waste Fuel	1982	1995	DW	FRP
2037	UST	Closed	600	Diesel	2037	1997	DW	FRP
2293	UST	Active	4000	Diesel	2293	Unknown	DW	FRP
2304	UST	Closed	4000	Diesel	2304	1993	DW	FRP
2339A	UST	Inactive	10000	Gasoline	2339	1994	DW	FRP
2339B	UST	Inactive	10000	Gasoline	2339	1994	DW	FRP
2339C	UST	Inactive	10000	Gasoline	2339	1994	DW	FRP
2339E	UST	Inactive	500	Used Oil	2339	1994	DW	Unknown
3176	UST	Closed	1000	Diesel	3176	1989	DW	FRP
3178	UST	Closed	1000	Diesel	3178	1989	DW	FRP
3179	UST	Closed	1000	Diesel	3179	1989	DW	FRP
3180	UST	Closed	1000	Diesel	3180	1989	DW	FRP
3181	UST	Closed	1000	Diesel	3181	1989	DW	FRP

Table 3-4: Regulated Generators (40 CFR 112)						
Generator ID	**Tank Type**	**Status**	**Nearest Building**	**Contents**	**Capacity (gallons)**	**Installation Year**
1708-INT	AST-INT	Inactive	1708	Diesel	75	Unknown
1971-INT	AST-INT	Active	1971	Diesel	260	Unknown
2231-INT	AST-INT	Active	2231	Diesel	300	Unknown
2232-INT	AST-INT	Inactive	2232	Diesel	500	Unknown
2234-INT	AST-INT	Inactive	2234	Diesel	60	Unknown
2334-INT	AST-INT	Active	2334	Diesel	569	2009
2344-INT	AST-INT	Inactive	2344	Diesel	500	Unknown
2362-INT	AST-INT	Inactive	2362	Diesel	458	Unknown
2385-INT	AST-INT	Active	2385	Diesel	100	Unknown
2394-INT	AST-INT	Active	2394	Diesel	200	1996
2439-INT	AST-INT	Inactive	2439	Diesel	500	Unknown

Table 3-5: Oil Water Separators					
Tank ID	**Status**	**Type**	**Capacity (gallons)**	**Nearest Building**	**Facility**
1985	Active	Field Constructed	1504	1985	Vehicle Wash Rack
2036	Active	Field Constructed	1128	2036	FRT
212	Inactive	Field Constructed	1000	212	Fuels Division
213	Inactive	Field Constructed	1000	213	Fuels Division
2345	Active	Field Constructed	500	2345	Garbage Truck Wash Rack
2364	Inactive	Field Constructed	3500	2364	Heavy Equipment Wash Rack
31	Active	Field Constructed	1128	31	PWD- Transportation
443	Inactive	Field Constructed	940	N/A	Fuels Division
Fuel Tanker Parking	Inactive	Field Constructed	3276	N/A	Unknown
Temporary Wash Rack	Active	Field Constructed	3366	N/A	Unknown

Table 3-6: Oil Containing Electrical Equipment (40 CFR 112)			
ID	**Capacity (gallons)**	**Condition**	**Location**
General Facility			
1	69	Fair	Rainbow Hill
2	69	Fair	Rainbow Hill
3	69	Fair	Rainbow Hill
4	69	Fair	Rainbow Hill
5	69	Fair	Rainbow Hill
6	69	Fair	Rainbow Hill
7	69	Fair	Rainbow Hill
8	69	Fair	Rainbow Hill
9	69	Fair	Rainbow Hill
10	69	Fair	Rainbow Hill
11	69	Fair	Rainbow Hill
12	69	Fair	Rainbow Hill
13	69	Fair	Rainbow Hill
14	69	Fair	Rainbow Hill
15	69	Fair	Rainbow Hill
16	69	Fair	Rainbow Hill
30	100	Poor	
31	210	Good	
39	100	Good	
88	200	Good	Filtration Plant
266	250	Poor	Adjacent to water on Pier 2
267	250	Poor	Adjacent to water on Pier 1
377	200	Fair	
386	300	Good	Inside Bldg 386 in basement PCB Containing Transformer
422*	Empty	Poor	
451	200	Fair	
598	261	Fair	
664	100	Fair	Capacity Estimated
724	100	Good	
726	119	Poor	
727	1950	Poor	Bldg 727
729	100	Fair	Unable to get inside volume estimated

Table 3-6: Oil Containing Electrical Equipment (40 CFR 112)			
ID	**Capacity (gallons)**	**Condition**	**Location**
730	100	Good	
731	400	Poor	
732	220	Fair	
737	100	Good	
978	2397	Fair	Adjacent to Pier 3
1207	200	Good	
1670	2700	Fair	Substation 1670
1670	2276	Good	Substation 1670
1684	100	Fair	Restaurant
1685	123	Fair	
1687	100	Fair	Gym
1688	155	Poor	Oil evident on Pad
1707	600	Poor	Bldg 1707
1708	1950	Fair	Bldg 1708
1709	1950	Fair	Bldg 1709
1715	100	Good	
1743	1158	Good	Substation 1743
1796	100	Fair	Commissary
1796	1000	Fair	Commissary (NEX)
1807	750	Poor	Brig
1815	575	Good	
1817	665	Good	Com Bldg
2035	100	Fair	Bowling Alley
2045	100	Fair	Central Tower
2116	200	Poor	
2129	150	Good	Marina
2155	229	Good	High School
2171	567	Good	Substation 2171
2200	255	Good	Middle School
2234	100	Poor	
2252	150	Good	
2260	100	Unknown	Coast Guard
2262	300	Fair	
2275*	Empty	Poor	Empty

Table 3-6: Oil Containing Electrical Equipment (40 CFR 112)			
ID	**Capacity (gallons)**	**Condition**	**Location**
2276	100	Poor	
2278	100	Good	
2279	100	Good	
2281	100	Poor	
2293	140	Good	Inside Bldg 2293
2297	200	Fair	
2303	200	Fair	Navy Lodge
2304	217	Poor	
2332	169	Good	Bldg 2332
2334	150	Good	Marina
2336	100	Good	Bank
2337	174	Fair	Church
2339	134	Fair	Gas Station
2351	100	Good	
2357	150	Fair	Marine
2357	100	Good	
2362	179	Good	Child Development Center
2394	200	Good	Commissary
2431	400	Fair	
2439	100	Fair	
2463	100	Good	Waterfront Area
2464	100	Good	
2690	200	Good	Bldg 2690
2692	200	Good	Bldg 2692
2694	200	Good	Bldg 2694
2696	200	Good	Bldg 2696
2698	200	Good	Bldg 2698
2834	150	Unknown	
3047*	N/A	Poor	
3138	500	Poor	Galley
3175	300	Fair	
3176	300	Poor	
3179	100	Fair	
3180	225	Good	

Table 3-6: Oil Containing Electrical Equipment (40 CFR 112)			
ID	**Capacity (gallons)**	**Condition**	**Location**
3188	300	Fair	
7871	100	Poor	
1796A	200	Good	Commissary (Grey)
1796B	200	Good	Commissary (Green)
2200-Middle School*	N/A	Poor	2200-Middle School
394 A	100	Poor	
Army Bldg	1000	Good	Army Bldg
Army Reserve	250	Good	Army reserve property near Pier 1
Building 500	300	Fair	Bldg 500 (3x Pole Mounts)
Building 519	200	Fair	Bldg 519 (2x Pole Mounts)
Elementary School	200	Fair	Elementary School
EOD	100	Good	Adjacent to Dry dock
FBI	94	Poor	FBI Facility
Lift Station	100	Poor	Lift Station
Substation D	2292	Good	Bowling Alley/Gas Station
Water Chill Plant	250	Fair	Water Chill Plant
Housing Transformers			
21 Cabot	69	Good	Housing
22 Cabot	69	Good	Housing
23 Cabot	69	Good	Housing
24 Cabot	69	Good	Housing
25 Cabot	69	Good	Housing
26 Cabot	69	Good	Housing
27 Bataan	69	Good	Housing
28 Bataan	69	Good	Housing
08 Cowpens	69	Good	Housing
04 Cowpens	69	Good	Housing
02 Cowpens	69	Good	Housing
19 Cowpens	69	Good	Housing
20 Cabot	69	Good	Housing
41 Monterey	69	Good	Housing
37 Monterey	69	Good	Housing
27 Monterey	69	Good	Housing
23 Monterey	69	Good	Housing

Table 3-6: Oil Containing Electrical Equipment (40 CFR 112)			
ID	**Capacity (gallons)**	**Condition**	**Location**
19 Monterey	69	Good	Housing
11 Monterey	69	Good	Housing
05 Monterey	69	Good	Housing
11 FDR	69	Good	Housing
03 FDR	69	Good	Housing
06 FDR	69	Good	Housing
10 FDR	69	Good	Housing
02 Monterey	~200	Good	Housing
04 Monterey	69	Good	Housing
06 Monterey	69	Good	Housing
08 Monterey	69	Good	Housing
12 Monterey	69	Good	Housing
14 Monterey	69	Good	Housing
16 Monterey	69	Good	Housing
18 Monterey	69	Good	Housing
22 Monterey	69	Good	Housing
26 Monterey	69	Good	Housing
06 San Jacinto	69	Good	Housing
10 San Jacinto	69	Good	Housing
16 San Jacinto	69	Good	Housing
20 San Jacinto	69	Good	Housing
12 Cowpens	~200	Good	Housing
19 Cowpens (2)	~200	Good	Housing
13/18 Cowpens	69	Good	Housing
17 Cowpens	69	Good	Housing
38 Monterey	69	Good	Housing
36 Monterey	69	Good	Housing
34 Monterey	69	Good	Housing
28 Monterey	69	Good	Housing
16 FDR	69	Good	Housing
24 FDR	69	Good	Housing
28 FDR	69	Good	Housing
59 Ranger	69	Good	Housing
53 Ranger	69	Good	Housing

Table 3-6: Oil Containing Electrical Equipment (40 CFR 112)			
ID	**Capacity (gallons)**	**Condition**	**Location**
47 Ranger	69	Good	Housing
87 Lexington	69	Good	Housing
81 Lexington	69	Good	Housing
78 Lexington	69	Good	Housing
84 Lexington	69	Good	Housing
92 Lexington	69	Good	Housing
50 Ranger	69	Good	Housing
54 Ranger	69	Good-Heavy Vegetation	Housing
38 Ranger	69	Good-Heavy Vegetation	Housing
35 Ranger	69	Good-Heavy Vegetation	Housing
20 Hancock	69	Good	Housing
07 Hancock	69	Good	Housing
26 Hancock	69	Good-Heavy Vegetation	Housing
08 Hancock	69	Good	Housing
02 Hancock	69	Good	Housing
09 Coral	69	Good	Housing
19 Coral	69	Good	Housing
27 Coral	69	Good	Housing
33 Coral	69	Good	Housing
37 Coral	69	Good-Heavy Vegetation	Housing
12 Franklin	69	Good	Housing
06 Franklin	69	Good	Housing
07 Franklin	69	Good	Housing
22 Franklin	69	Good	Housing
01 Yorktown	~200	Good	Housing
01 Hornet	~200	Good	Housing
14 Coral	69	Good	Housing
16 Coral	69	Good	Housing
51 Yorktown	69	Good	Housing
52 Yorktown	69	Good	Housing
45 Yorktown	69	Good	Housing
41 Yorktown	69	Good	Housing
48 Yorktown	69	Good	Housing
27 Yorktown	69	Good	Housing

Table 3-6: Oil Containing Electrical Equipment (40 CFR 112)			
ID	**Capacity (gallons)**	**Condition**	**Location**
38 Yorktown	69	Good	Housing
30 Yorktown	69	Good	Housing
24 Yorktown	69	Good	Housing
25 Yorktown	69	Good	Housing
18 Yorktown	69	Good	Housing
17 Yorktown	69	Good	Housing
13 Yorktown	69	Good	Housing
12 Yorktown	69	Good	Housing
07 Yorktown	69	Good	Housing
10 Yorktown	69	Good	Housing
16 Yorktown	69	Good	Housing
20 Hornet	69	Good-Heavy Vegetation	Housing
12 Hornet	69	Unknown- Heavy Vegetation	Housing
06 Hornet	69	Good-Heavy Vegetation	Housing
30 Ranger	69	Good	Housing
24 Ranger	69	Good	Housing
11 Randolf	69	Good	Housing
15 Randolf	69	Good	Housing
08 Randolf	69	Good	Housing
02 Randolf	69	Good	Housing
07 Randolf	69	Good	Housing
03 Randolf	69	Good	Housing
06 Randolf	69	Good	Housing
04 Intrepid	69	Good	Housing
07 Intrepid	69	Good	Housing
13 Intrepid	69	Good	Housing
12 Intrepid	69	Good	Housing
16 Intrepid	69	Good	Housing
1676 Intrepid	69	Good	Housing
04 Ranger	69	Good	Housing
03 Ranger	69	Good	Housing
10 Ranger	69	Good	Housing
09 Ranger	69	Good	Housing
18 Ranger	69	Good	Housing

Table 3-6: Oil Containing Electrical Equipment (40 CFR 112)			
ID	**Capacity (gallons)**	**Condition**	**Location**
1677 Intrepid	69	Good	Housing
67 Lexington	69	Good	Housing
06 Coral	69	Unknown-Heavy Vegetation	Housing
02 Cruz	69	Good	Housing
01 Cruz	69	Good	Housing
12 American	69	Good	Housing
13 American	69	Good	Housing
11 American	69	Good	Housing
08 American	69	Good	Housing
07 American	69	Unknown-Heavy Vegetation	Housing
03 American	69	Good	Housing
04 American	69	Good	Housing
02 American	69	Good	Housing
47 American	69	Good	Housing
40 American	69	Good	Housing
43 American	69	Good	Housing
34 American	69	Good	Housing
39 American	69	Good	Housing
30 American	69	Good	Housing
37 American	69	Unknown-Heavy Vegetation	Housing
28 American	69	Unknown-Heavy Vegetation	Housing
29 American	69	Good	Housing
27 American	69	Good	Housing
24 American	69	Good	Housing
Main American	~400	Good	Housing
2388 Midway	~300	Good	Housing
25 American	69	Good	Housing
20 American	69	Good	Housing
23 American	69	Unknown-Heavy Vegetation	Housing
16 American	69	Unknown-Heavy Vegetation	Housing
04 Cruz	69	Damaged	Housing

Table 3-6: Oil Containing Electrical Equipment (40 CFR 112)			
ID	Capacity (gallons)	Condition	Location
61 Saratoga	69	Good	Housing
88 Saratoga	69	Good	Housing
59 Saratoga	69	Good	Housing
53 Saratoga	69	Good	Housing
86 Saratoga	69	Good	Housing
02 Anzio	69	Fair	Housing
01 Anzio	69	Good	Housing
08 Anzio	69	Unknown-Heavy Vegetation	Housing
12 Anzio	69	Good	Housing
05 Anzio	69	Good	Housing
06 Bunker	69	Unknown-Heavy Vegetation	Housing
03 Bunker	69	Good	Housing
78 Saratoga	69	Good	Housing
47 Saratoga	69	Good	Housing
76 Saratoga	69	Unknown-Heavy Vegetation	Housing
45 Saratoga	69	Good	Housing
70 Saratoga	69	Good	Housing
62 Saratoga	69	Good	Housing
43 Saratoga	69	Good	Housing
39 Saratoga	69	Good	Housing
50 Saratoga	69	Good	Housing
33 Saratoga	69	Unknown-Heavy Vegetation	Housing
46 Saratoga	69	Good	Housing
38 Saratoga	69	Good	Housing
27 Saratoga	69	Good	Housing
34 Saratoga	69	Good	Housing
23 Saratoga	69	Good	Housing
19 Saratoga	69	Good	Housing
28 Saratoga	69	Unknown-Heavy Vegetation	Housing
20 Saratoga	69	Good	Housing
01 Enterprise	69	Good	Housing
16 Saratoga	69	Good	Housing

Table 3-6: Oil Containing Electrical Equipment (40 CFR 112)			
ID	**Capacity (gallons)**	**Condition**	**Location**
09 Saratoga	69	Good	Housing
10 Saratoga	69	Good	Housing
01 Saratoga	69	Good	Housing
04 Saratoga	69	Good	Housing
06 Wasp	69	Good	Housing
05 Wasp	69	Good	Housing
14 Wasp	69	Good	Housing
19 Wasp	69	Good	Housing
18 Wasp	69	Good	Housing
25 Wasp	69	Good	Housing
24 Wasp	69	Unknown-Heavy Vegetation	Housing
32 Wasp	69	Good	Housing
38 Wasp	69	Good	Housing
17 Essex	69	Unknown-Heavy Vegetation	Housing
04 Enterprise	69	Good	Housing
07 Enterprise	69	Good	Housing
14 Essex	69	Unknown-Heavy Vegetation	Housing
08 Essex	69	Good	Housing
09 Essex	69	Good	Housing
03 Essex	69	Good	Housing
04 Essex	69	Good	Housing
04 Ticonderoga	69	Good	Housing
03 Ticonderoga	69	Good	Housing
05 Ticonderoga	69	Good	Housing
13 Enterprise	69	Good	Housing
09 Enterprise	69	Good	Housing
10 Enterprise	69	Good	Housing
14 Enterprise	69	Good	Housing
22 Enterprise	69	Good	Housing
17 Enterprise	69	Good	Housing
25 Enterprise	69	Good	Housing
28 Enterprise	69	Good	Housing
31 Enterprise	69	Good	Housing

Table 3-6: Oil Containing Electrical Equipment (40 CFR 112)			
ID	**Capacity (gallons)**	**Condition**	**Location**
34 Enterprise	69	Fair	Housing
Pool Midway	~200	Good	Housing
40 Enterprise	69	Good	Housing
46 Enterprise	69	Good	Housing
43 Enterprise	69	Good	Housing
47 Enterprise	69	Good	Housing
52 Enterprise	69	Good	Housing
58 Enterprise	69	Good	Housing
49 Lexington	69	Good	Housing
57 Lexington	69	Good	Housing
58 Lexington	69	Good	Housing
61 Lexington	69	Good	Housing
62 Lexington	69	Good	Housing
50 Lexington	69	Good	Housing
46 Lexington	69	Good	Housing
41 Lexington	69	Good	Housing
35 Lexington	69	Good	Housing
Midway Main	Unknown	Good	Housing
38 Lexington	69	Good	Housing
29 Lexington	69	Good	Housing
23 Lexington	69	Good	Housing
24 Lexington	69	Good	Housing
20 Lexington	69	Good	Housing
19 Lexington	69	Good	Housing
15 Lexington	69	Good	Housing
05 Lexington	69	Good	Housing
Saratoga Main	Unknown	Good	Housing
899 Algodones	130	Good	Housing
897 Algodones	140	Good	Housing
895 Algodones	140	Good	Housing
889 Algodones	140	Good	Housing
885 Algodones	140	Good	Housing

Table 3-7: PST Discharge Prevention Measures									
Tank ID	**Tank Type**	**Capacity (gallons)**	**Contents**	**Status**	**Tank Secondary Containment**	**Overfill Protection**	**Spill Catchment**	**Tank Leak Detection**	**40 CFR 112 Required Upgrades**
1090A	AST	3000	Gasoline	Active	DW	Visible Gauge	Overfill Containment	Interstitial Popup/ Visual Inspection	Repair/replace tank gauges.
1090B	AST	2000	Diesel	Active	DW	Visible Gauge	Overfill Containment	Interstitial Popup/ Visual Inspection	None
1205	AST	1000	Diesel	Active	DW	Visible Gauge, High Level Alarm	Overfill Containment	Electronic Leak Detection	None
1207	AST	500	Diesel	Active	Dike Tank	Visible Gauge	Overfill Containment	Visual Inspection	Recoat/repair secondary containment, replace missing fittings, and provide lock for secondary containment valve.
124A	UST	2500	Diesel	Active	DW	High-level Alarm	Spill Bucket	Veeder-Root	None
124B	UST	6000	Gasoline	Active	DW	High-level Alarm	Spill Bucket	Veeder-Root	None
124C	UST	6000	Gasoline	Active	DW	High-level Alarm	Spill Bucket	Veeder-Root	None
1691	AST	1000	Diesel	Active	DW	Visual Gauge, High-Level Alarm	Overfill Containment	Warrick Controls	None
1758	AST	500	Diesel	Active	Concrete/Block	High-level Alarm	Inside Dike	Visual Inspection	Install overfill protection. Repair high level alarm.
1817 A	AST	5000	Diesel	Active	DW	Visible Gauge/High-Level Alarm	Overfill Containment	Veeder-Root	None

Table 3-7: PST Discharge Prevention Measures									
Tank ID	**Tank Type**	**Capacity (gallons)**	**Contents**	**Status**	**Tank Secondary Containment**	**Overfill Protection**	**Spill Catchment**	**Tank Leak Detection**	**40 CFR 112 Required Upgrades**
1817 B	AST	5000	Diesel	Active	DW	Visible Gauge/High-Level Alarm	Overfill Containment	Veeder-Root	None
1920	AST	500	Diesel	Active	DW	Visible Gauge/High-Level Alarm	Overfill Containment	Warrick Controls	None
1971-INT	AST-INT	260	Diesel	Active	Concrete/Block	Visible Gauge	Inside Dyke	Visual Inspection	None
2017	AST	500	Diesel	Active	DW	Visible Gauge	Overfill Containment	Pop-up Display	Repair/Replace interstitial monitoring gauge.
2020	AST	500	Diesel	Active	DW	Visible Gauge	Overfill Containment	Visual Inspection Pop-up Gauge	Repair/Replace main tank and interstitial monitoring gauge.
2021	AST	500	Diesel	Active	Concrete/Block	Visible Gauge/High-Level Alarm	None	Visual Inspection	None
2231-INT	AST-INT	300	Diesel	Active	Concrete/Block	Visible Gauge	Inside Dike	Visual Inspection	None
2248	AST	5000	Diesel	Active	Concrete/Block	High-level Alarm	Inside Dike	Visual Inspection	Verify capacity of secondary containment is 110% tank capacity.
2293	UST	4000	Diesel	Active	DW	High-Level Alarm	Spill Bucket	Veeder-Root	None
2303-2	AST	500	Diesel	Active	Concrete/Block	Visible Gauge	Inside Dike	Visual Inspection	Repair/replace pop-up gauge.
2334-INT	AST-INT	569	Diesel	Active	DW	Visible Gauge	None	Visual Inspection	None
2360	AST	500	Diesel	Active	DW	Visible Gauge/High-Level Alarm	Overfill Containment	Warrick Controls	None

Table 3-7: PST Discharge Prevention Measures									
Tank ID	**Tank Type**	**Capacity (gallons)**	**Contents**	**Status**	**Tank Secondary Containment**	**Overfill Protection**	**Spill Catchment**	**Tank Leak Detection**	**40 CFR 112 Required Upgrades**
2361	AST	500	Diesel	Active	DW	Visible Gauge/High-Level Alarm	Overfill Containment	Warrick Controls	None
2385-INT	AST-INT	100	Diesel	Active	Concrete/Block	Visible Gauge	Inside Dike	Visual Inspection	None
2394-INT	AST-INT	200	Diesel	Active	DW	Visible Gauge	None	Visual Inspection	None
2406	AST	500	Diesel	Active	Concrete/Block	Visible Gauge	Overfill Containment	Visual Inspection	Repair/replace visible gauge, provide locking mechanism for drainage valve. Repair corrosion on tank & piping.
2426	AST	500	Diesel	Active	Concrete/Block	None	Inside Dike	Visual Inspection	None
542	AST	500	Diesel	Active	Concrete/Block	High-Level Alarm	Inside Dike	Visual Inspection	None
737	AST	500	Diesel	Active	Concrete/Block	Visible Gauge	Inside Dike	Visual Inspection	None
784	AST	150	Diesel	Active	Concrete/Block	None	None	Visual Inspection	None
798	AST	500	Diesel	Active	DW	Visible Gauge/High-Level Alarm	Overfill Containment	Warrick Controls	None
88	AST	500	Diesel	Active	DW	Visible Gauge/High-Level Alarm	Overfill Containment	Warrick Controls	None
PRT	AST	500	Diesel	Active	DW	Visible Gauge	Overfill Containment	Interstitial Monitor	None

Table 3-8: Agency and Personnel Contact Information			
PRIORITIZED CONTACT LIST	**RESPONSE ROLE**	**DAY PHONE**	**24-HOUR PHONE**
On Facility Contact Information			
Facility Incident Commander Name: **Danial Kalal** Response Time: 0.5 hours	Incident command and control Facility Qualified Individual	(787) 534-0900	Not Available
Facility Response/Cleanup Team (BOSC) (Power Cooling & Controls)	Mitigate and Cleanup spills	(787) 272-5900	(787) 690-9898
NAPR Fire Department	Assist in the response & management of the incident	(787) 286-9139	(787) 865-4405
NAPR Dispatch	Facility Security Notification	(787) 534-0941	(787) 534-0941
Naval Facility Contact Information			
Commander Navy Region South East (CNRSE) Naval Air Station, Jacksonville Point of Contact: **Duty Officer** Response Time: Not available	Provide additional equipment and personnel resources	Not Provided	(904) 542-2338
Federal Response Agencies			
NATIONAL RESPONSE CENTER	Receiver of all spill reports and notifies appropriate FOSC	(800) 424-8802	(800) 424-8802
Response Contractors **NAVSUPSALV (Navy Supervisor of Salvage)** Point of Contact: **Duty Officer** Response Time: 16 hours	Provide additional equipment and personnel resources Provides response expertise	(202) 781-1731	(202) 781-3889
Response Contractors **USCG Marine Safety Office** Point of Contact: **Duty Officer** Response Time: 1.5-2 hours	Provide additional equipment and personnel resources Provide 2 oil spill response trailers and 1 each chemical spill response van and trailer with material to make level A, B, and C entries, and 2 V.O.S.S. systems with 1-1,200 gpm pump and 2-26,320 gal. cap barges	(787) 706-2444 (787) 289-2040	(787) 729-6800
Technical Support Point of Contact: **USCG National Strike Force Coordination Center (NSFCC)** Response Time: TBD	Coordination of USCG Strike Team's response equipment	(252) 331-6000	(252) 267-3458
Technical Support Point of Contact: **Gulf Strike Team (GST)** Response Time: TBD	Primary Strike Team for the Caribbean	(251) 441-6601	(251) 441-6601 (forwards to watch standard)
Private Response Contractors			

Table 3-8: Agency and Personnel Contact Information			
PRIORITIZED CONTACT LIST	**RESPONSE ROLE**	**DAY PHONE**	**24-HOUR PHONE**
Local Response Contractors **Clean Caribbean & Americas** Point of Contact: Skip Przelomski or "On Call" Technical Advisor	Provide additional equipment and personnel: 21,650 additional booms, 125 anchors, 45,000 gal. cap bladders, 24,000 gal. cap storage tanks, 31 assorted pumps, 7 boats and 361 sorbent bales	(954) 983-9880	(305) 983-9880
Red Caribeña de Varamientos (Caribbean Stranding Network) Point of Contact: Mr. Antonio Mignucci	Assistance with animal rehabilitation	(787) 759-8432	Not Available
Other Federal Agencies			
Federal Agencies **U.S. Fish and Wildlife Service** Caribbean Ecological Services Field Office, Boqueron, PR	Assistance with animal rehabilitation	(787) 851-7297	Not Available
DOD Agencies **U.S. Army Corps of Engineers Regulatory Section, Antilles** Point of Contact: Sindulfo Castillo, Chief- CE	Heavy Equipment	(787) 729-6905	(787) 729-6905
Reporting Agencies			
Local Emergency Planning Committee (LEPC) **Carolina LEPC, PR** Point of Contact: Enid Drevon	Incident Reporting	(787) 767-8181 Ext- 2253	Not Available
Local Emergency Planning Committee (LEPC) **Humacao LEPC, PR** Point of Contact: Brenda Rodriguez	Incident Reporting	(787) 285-2818	Not Available
Local Emergency Planning Committee (LEPC) **San Juan LEPC, PR** Point of Contact: Harold Alcover	Incident Reporting	(787) 767-8181 Ext- 2225	Not Available
State Environmental Regulatory Agency Point of Contact: **Puerto Rico Environmental Quality Board**	Incident reporting	(787)766-2823	Not Available
Federal Environmental Regulatory Agency Point of Contact: **Environmental Protection Agency - Caribbean Environmental Protection Division** Point of Contact: Carl-Axel Soderberg	Incident reporting	(787) 977-5870	Not Provided
State Emergency Response Commission (SERC) Point of Contact: **Puerto Rico Environmental Quality Board** Point of Contact: Enid Drevon	Incident reporting Emergency response	(787) 767-8181 Ext- 2253	Not Provided

Table 3-8: Agency and Personnel Contact Information			
PRIORITIZED CONTACT LIST	**RESPONSE ROLE**	**DAY PHONE**	**24-HOUR PHONE**
Fire Departments			
Local (city/county) Response Team, Fire Department, HazMat Team **Cuerpo De Bomberos, Central Office, San Juan**	Emergency medical Haz Mat response support Fire suppression support	(787) 725-3444	(787) 725-3444
Local (city/county) Response Team, Fire Department, HazMat Team **Cuerpo De Bomberos, Fajardo** Response Time: 0.5 hours	Emergency medical HazMat response support Fire suppression support	(787) 863-2330	(787) 863-2330
Local (city/county) Response Team, Fire Department, HazMat Team **Cuerpo De Bomberos, Ceiba** Response Time: 0.5 hours	Emergency medical HazMat response support Fire suppression support	(787) 885-2330	(787) 885-2330
Local (city/county) Response Team, Fire Department, HazMat Team **Cuerpo De Bomberos, Humacao** Response Time: 1 hour	Emergency medical HazMat response support Fire suppression support	(787) 852-2330	(787) 852-2330
Police Departments (911)			
Local Police Point of Contact: **Policia, Region de Fajardo**	Traffic control Evacuation Crowd control	(787) 889-1737 (787) 889-0909	(787) 889-1737 (787) 889-0909
Local Police Point of Contact: **Policia, Region de Humacao**	Traffic control Evacuation Crowd control	(787) 852-1224	(787) 852-1224
Emergency Broadcast Contacts			
Local Radio Point of Contact: **WDOY FM Fajardo**	Broadcast evacuation notices	(787) 723-9696	(787) 723-9696
Local Radio Point of Contact: **WUNO – NOTI UNO Broadcast Network, Metro**	Broadcast evacuation notices	(787) 758-7230	(787) 758-7230
Local Radio Point of Contact: **WOSO 1030AM, San Juan**	Broadcast evacuation notices	(787) 724-3940	(787) 724-3940
Local TV Point of Contact: **WAPA TV, San Juan, Channel 4**	Broadcast evacuation notices	(787) 792-4444	(787) 792-4444
Local TV Point of Contact: **WSTE-DT Channel 7 TV San Juan**	Broadcast evacuation notices	(787) 724-7777	(787) 724-7777

Table 3-8: Agency and Personnel Contact Information			
PRIORITIZED CONTACT LIST	**RESPONSE ROLE**	**DAY PHONE**	**24-HOUR PHONE**
Weather			
Local Weather Point of Contact: **National Weather Service – San Juan**	Weather forecasts Public forecasts Marine forecasts	(787) 253-4588	(787) 253-4588
Hospitals and Emergency Medical Services (911) **Note: Some hospitals may not be set up for in-house decontamination. Ensure field decontamination is performed prior to transport.**			
Hospital(s) Point of Contact: **HIMA- San Pablo, Fajardo**	Medical support	(787) 655-0505	(787) 655-0505
Hospital(s) Point of Contact: **UPR Carolina**	Medical support	(787) 757-1800	(787) 757-1800
Hospital(s) Point of Contact: **Metropolitan Hospital, San Juan**	Medical support	(787) 793-5013	(787) 793-5013
Hospital(s) Point of Contact: **Hospital Dr. Dominquez, Humacao**	Medical support	(787) 852-0505	(787) 852-0505
Hospital(s) Point of Contact: **Hospital Ryder Memorial, Humacao**	Medical support	(787) 852-0768	(787) 852-0768
Emergency Medical Services (EMS) Point of Contact: **Puerto Rico EMS, San Juan**	Medical support	(787) 765-1733	(787) 765-1733

Table 3-9: Spill Response Notification	
Name of Person Completing Form	
Date & Time Form Completed/Updated	
REPORTER INFORMATION	
Date and Time Initial Spill Report Received (24 hour time)	
REPORTER'S NAME (LAST, FIRST)	
REPORTER'S PHONE NUMBER	
Company, Squadron, Shop, or Department	
Position	
Reporter's Location	Building # and Street:
	City:
	State and Zip Code:
Confidential	☐ YES ☐ NO
INCIDENT DESCRIPTION	
MATERIAL RELEASED ☐ YES	☐ Oil/Fuel Type of Fuel ________________ ☐ Hazmat/Unknown Chemical Name & CHRIS Code__________
☐ NO	Is material a CERCLA Hazardous Substance? ☐ Yes ☐ No Is material an Extremely Hazardous Substance? ☐ Yes ☐ No
	Best Estimate of Quantity Released to Land ____________(include units) Best Estimate of Quantity Released to Water ____________(include units)
	Is material still being released ☐ Yes ☐ No Current Spill Rate__________
TYPE OF INCIDENT (CHECK ALL THAT APPLY)	☐ Inside building or containment area ☐ Flightline ☐ Soil ☐ Navigable Water (freshwater, marine, wetland, storm drain) ☐ Release to sanitary sewer ☐ Fire ☐ Explosion ☐ Air Release
SOURCE AND CAUSE OF INCIDENT	
DATE AND TIME OF INCIDENT (24 hour time)	
Date & Time Form Completed/Updated	
REPORTER INFORMATION	
Date and Time Initial Spill Report Received (24 hour time)	
REPORTER'S NAME (LAST, FIRST)	

Table 3-9: Spill Response Notification

REPORTER'S PHONE NUMBER	
Company, Squadron, Shop, or Department	
Position	
Reporter's Location	Building # and Street:
	City:
	State and Zip Code:
Confidential	☐ YES ☐ NO
INCIDENT DESCRIPTION	
MATERIAL RELEASED ☐ YES	☐ Oil/Fuel Type of Fuel _________________ ☐ Hazmat/Unknown Chemical Name & CHRIS Code__________
☐ NO	Is material a CERCLA Hazardous Substance? ☐ Yes ☐ No Is material an Extremely Hazardous Substance? ☐ Yes ☐ No
	Best Estimate of Quantity Released to Land ____________(include units) Best Estimate of Quantity Released to Water ____________(include units)
	Is material still being released ☐ Yes ☐ No Current Spill Rate__________
TYPE OF INCIDENT **(CHECK ALL THAT APPLY)**	☐ Inside building or containment area ☐ Flightline ☐ Soil ☐ Navigable Water (freshwater, marine, wetland, storm drain) ☐ Release to sanitary sewer ☐ Fire ☐ Explosion ☐ Air Release
SOURCE AND CAUSE OF INCIDENT	
DATE AND TIME OF INCIDENT (24 hour time)	
INCIDENT ADDRESS/LOCATION	
(include state and zip code)	
County	
Nearest City & Distance from City (miles)	
Latitude (for marine spills)	___ Degrees___ Minutes ___ Seconds
Longitude (for marine spills)	___ Degrees___ Minutes ___ Seconds
Container Type & Capacity (include units)	
Facility Capacity (include units)	
Weather Conditions	
Wind speed and direction. Temperature	
Precipitation Rate and Type	

Table 3-9: Spill Response Notification	
Wave\Current Information (marine spills)	
RESPONSE ACTIONS	
Initial Actions Taken	1. Locate spill reporter.
	2. Establish initial command post location.
	3. Assign recorder.
	4. Rescue any injured individuals.
	5. Secure spill area and determine need for evacuation.
	6. Stop spill source, if not already accomplished.
	7. Complete initial site and material hazard assessments.
	8. Prepare site maps.
	9. Establish hot/warm/cold/safe zones
	10. Prevent spill from spreading.
Actions Taken to Stop Release	
Actions Taken to Contain Release	
Actions Taken to Cleanup Release	
IMPACT/HEALTH THREATS	
NUMBER OF INJURIES	
NUMBER OF DEATHS	
EVACUATION(S) REQUIRED	☐ Yes ☐ NO
Description of Areas to be Evacuated and Areas Already Evacuated including Number Evacuated	
Was There Any Property Damage?	☐ YES ☐ NO
Damage in Dollars (estimated)	
Environmental Media Affected	

Table 3-9: Spill Response Notification

DESCRIPTION OF ENVIRONMENTAL AND HEALTH THREATS INCLUDINGAREAS THREATENED	
PRECAUTIONS TO MINIMIZE HEALTH THREATS TO LOCAL RESIDENTS INCLUDING MEDICAL ADVICE	
Additional Information Any information about the incident not recorded elsewhere in the report	

AGENCY NOTIFICATIONS			
NOSC	□ YES	□ NO	TIME:
NRC 1-800-424-8802	□ YES TIME (24 Hour):	□ NO	NRC Call No.___________________
EPA	□ YES	□ NO	TIME:
USCG	□ YES	□ NO	TIME:
AS State Dept. of Emergency Mgmt.	□ YES	□ NO	TIME:
AS State Dept. of Environment	□ YES	□ NO	TIME:
Iceberg County Emergency Services	□ YES	□ NO	TIME:
Other (List)	□ YES	□ NO	TIME:
Other (List)	□ YES	□ NO	TIME:
Other (List)	□ YES	□ NO	TIME:

Table 3-10: PST Information For Potential Tank Failures											
Tank ID	**Tank Type**	**Status**	**Capacity (gallons)**	**Contents**	**Nearest Building**	**Facility**	**Initial Spill Direction**	**Initial Receptor**	**Initial Conveyance**	**Ultimate Discharge**	**Probability of Reaching Water**
1090A	AST	Active	3000	Gasoline	2334	AAFES	West	Ground at Tank	Overland Flow	Ensenada Honda	Very High
1090B	AST	Active	2000	Diesel	2334	AAFES	West	Ground at Tank	Overland Flow	Ensenada Honda	Very High
1205	AST	Active	1000	Diesel	1205	Unknown (BOSC)	South	Ground at Tank	Sheet Flow	Ensenada Honda	Moderate
1207	AST	Active	500	Diesel	1207	Unknown	Southwest	Ground at Tank	Sheet Flow	Ensenada Honda	Low
124A	UST	Active	2500	Diesel	124	BOSC Fueling Station	Southeast	N/A	N/A	Ensenada Honda	Low
124B	UST	Active	6000	Gasoline	124	BOSC Fueling Station	Southeast	N/A	N/A	Ensenada Honda	Low
124C	UST	Active	6000	Gasoline	124	BOSC Fueling Station	Southeast	N/A	N/A	Ensenada Honda	Low
1691	AST	Active	1000	Diesel	1691	Unknown (BOSC)	Southwest	Ground at Tank	Sheet Flow	Atlantic Ocean	Very High
1758	AST	Active	500	Diesel	2019	Unknown (BOSC)	West	Secondary Containment in Building	Sheet Flow	Atlantic Ocean	Low
1817 A	AST	Active	5000	Diesel	1817	Unknown	South	Ground at Tank	Drainage Ditch	Ensenada Honda	Low
1817 B	AST	Active	5000	Diesel	1817	Unknown	South	Ground at Tank	Drainage Ditch	Ensenada Honda	Low
1920	AST	Active	500	Diesel	1920	Unknown (BOSC)	West	Mangrove adjacent to site	Sheet Flow	Ensenada Honda	Low
1971-INT	AST-INT	Active	260	Diesel	1971	Unknown (BOSC)	South	Concrete Containment Inside Building	Sheet Flow	Ensenada Honda	Low
2017	AST	Active	500	Diesel	2017	Unknown (BOSC)	West	Mangroves Adjacent to Site	Sheet Flow	Atlantic Ocean	Low
2020	AST	Active	500	Diesel	2020	Unknown (BOSC)	South	Ground at Tank	Sheet Flow	Atlantic Ocean	Low

Table 3-10: PST Information For Potential Tank Failures											
Tank ID	Tank Type	Status	Capacity (gallons)	Contents	Nearest Building	Facility	Initial Spill Direction	Initial Receptor	Initial Conveyance	Ultimate Discharge	Probability of Reaching Water
2021	AST	Active	500	Diesel	2021	Unknown (BOSC)	Southeast	Containment Inside Building	Sheet Flow	Atlantic Ocean	Low
2231-INT	AST-INT	Active	300	Diesel	2231	Unknown (BOSC)	Southwest	Concrete Containment Inside Building	Sheet flow	Ensenada Honda	Moderate
2248	AST	Active	5000	Diesel	2248	Unknown (BOSC)	Southeast	Secondary Containment	Sheet Flow	Ensenada Honda	Low
2293	UST	Active	4000	Diesel	2293	Unknown (BOSC)	East	N/A	N/A	Atlantic Ocean	Low
2303-2	AST	Active	500	Diesel	2303	Unknown (BOSC)	Southeast	Secondary Containment	Sheet Flow	Ensenada Honda	Low
2334-INT	AST-INT	Active	569	Diesel	2334	Unknown (BOSC)	South	Concrete containment area	Sheet flow	Ensenada Honda	High
2360	AST	Active	500	Diesel	2360	Unknown (BOSC)	West	Ground at Tank	Sheet Flow	Atlantic Ocean	Low
2361	AST	Active	500	Diesel	2361	Unknown (BOSC)	Southeast	Ground at Tank	Sheet Flow	Atlantic Ocean	Low
2385-INT	AST-INT	Active	100	Diesel	2385	Unknown (BOSC)	West	Concrete Containment Inside Building	Sheet flow	Atlantic Ocean	Low
2394-INT	AST-INT	Active	200	Diesel	2394	Unknown (BOSC)	West	Storm Drain	Sheet Flow	Ensenada Honda	Low
2406	AST	Active	500	Diesel	2406	Unknown (BOSC)	East	Secondary Containment	Sheet Flow	Atlantic Ocean	Low
2426	AST	Active	500	Diesel	2426	Unknown	Southwest	Concrete Containment	Sheet flow	Ensenada Honda	Low
542	AST	Active	500	Diesel	542/2016	Unknown (BOSC)	South	Secondary Containment Inside Building	Sheet Flow	Atlantic Ocean	Low
737	AST	Active	500	Diesel	737	Unknown (BOSC)	Southeast	Secondary Containment	Sheet Flow	Ensenada Honda	Low

Table 3-10: PST Information For Potential Tank Failures											
Tank ID	**Tank Type**	**Status**	**Capacity (gallons)**	**Contents**	**Nearest Building**	**Facility**	**Initial Spill Direction**	**Initial Receptor**	**Initial Conveyance**	**Ultimate Discharge**	**Probability of Reaching Water**
784	AST	Active	150	Diesel	784	Unknown (BOSC)	South	Concrete Containment	Sheet flow	Ensenada Honda	Low
798	AST	Active	500	Diesel	798	Unknown (BOSC)	South	Parking lot	Sheet Flow	Atlantic Ocean	Low
88	AST	Active	500	Diesel	88	Unknown (BOSC)	North	Ground at Tank	Sheet Flow	Ensenada Honda	Medium
PRT	AST	Active	500	Diesel	737	Puerto Rico Telephone (Non-NAPR)	Southeast	Concrete Pad/ Ground	Sheet Flow	Ensenada Honda	Low

Table 3-11: Recommended Inspections				
Type	**Frequency**	**Checklist to Use (Appendix F)**	**Location Records Kept**	**Who Performs**
POL TANKS				
Accumulated Rain Water (Diked/Sump Areas)	Before Draining	1	Main Office	Operator
AST & Transfer Piping Inspection Including Leak Detection Systems, High Level Alarms, Overfill Prevention, Active Cathodic Protection Systems, Foundations & Supports	Monthly	4	Main Office	Operator
UST & Transfer Piping Inspection Including Leak Detection Systems, High Level Alarms, Overfill Prevention, Active Cathodic Protection Systems, Foundations & Supports	Monthly	3	Main Office	Operator
Offloading/Loading Area Inspections	Monthly	5	Main Office	Operator
Passive Cathodic Protection Systems Monitoring (Sacrificial Anode)	Quarterly	7	Main Office	Operator
FUEL STATIONS				
Accumulated Rain Water (Diked/Sump Areas)	Before Draining	1	Main Office	Operator
UST & Transfer Piping Inspection Including Leak Detection Systems, High Level Alarms, Overfill Prevention, Active Cathodic Protection Systems, Foundations & Supports	Monthly	3	Main Office	Operator
AST & Transfer Piping Inspection Including Leak Detection Systems, High Level Alarms, Overfill Prevention, Foundations & Supports	Monthly	4	Main Office	Operator
GENERATORS/TRANSFORMERS				
Spills and Corrosion	Monthly	8	Main Office	Operator

Table 3-12: Recommended Leak Detection Inspection Frequency for Active PSTs						
Tank ID	**Tank Type**	**Capacity (gallons)**	**Contents**	**Current Use**	**Tank Leak Detection**	**Routine Inspection Frequency**
1090A	AST	3000	Gasoline	Fueling - Marine	Interstitial Popup/ Visual Inspection	Monthly
1090B	AST	2000	Diesel	Fueling - Marine	Interstitial Popup/ Visual Inspection	Monthly
1205	AST	1000	Diesel	Emergency Power Generation	Electronic leak Detection	Monthly
1207	AST	500	Diesel	Emergency Power Generation	Visual Inspection	Monthly
124A	UST	2500	Diesel	Fueling - Motor Vehicle	Veeder-Root	Monthly
124B	UST	6000	Gasoline	Fueling - Motor Vehicle	Veeder-Root	Monthly
124C	UST	6000	Gasoline	Fueling - Motor Vehicle	Veeder-Root	Monthly
1691	AST	1000	Diesel	Emergency Power Generation	Warrick Controls	Monthly
1758	AST	500	Diesel	Emergency Power Generation	Visual Inspection	Monthly
1817 A	AST	5000	Diesel	Emergency Power Generation	Veeder-Root	Monthly
1817 B	AST	5000	Diesel	Emergency Power Generation	Veeder-Root	Monthly
1920	AST	500	Diesel	Emergency Power Generation	Warrick Controls	Monthly
1971-INT	AST-INT	260	Diesel	Emergency Power Generation	Visual Inspection	Monthly
2017	AST	500	Diesel	Emergency Power Generation	Pop-up Display	Monthly
2020	AST	500	Diesel	Emergency Power Generation	Visual Inspection Pop-up Gauge	Monthly
2021	AST	500	Diesel	Emergency Power Generation	Visual Inspection	Monthly
2231-INT	AST-INT	300	Diesel	Emergency Power Generation	Visual Inspection	Monthly
2248	AST	5000	Diesel	Emergency Power Generation	Visual Inspection	Monthly
2293	UST	4000	Diesel	Emergency Power Generation	Veeder-Root	Monthly
2303-2	AST	500	Diesel	Emergency Power Generation	Visual Inspection	Monthly
2334-INT	AST-INT	569	Diesel	Emergency Power Generation	Visual Inspection	Monthly
2360	AST	500	Diesel	Emergency Power Generation	Warrick Controls	Monthly
2361	AST	500	Diesel	Emergency Power Generation	Warrick Controls	Monthly
2385-INT	AST-INT	100	Diesel	Emergency Power Generation	Visual Inspection	Monthly
2394-INT	AST-INT	200	Diesel	Emergency Power Generation	Visual Inspection	Monthly
2406	AST	500	Diesel	Emergency Power Generation	Visual Inspection	Monthly
2426	AST	500	Diesel	Emergency Power Generation	Visual Inspection	Monthly
542	AST	500	Diesel	Emergency Power Generation	Visual Inspection	Monthly
737	AST	500	Diesel	Emergency Power Generation	Visual Inspection	Monthly
784	AST	150	Diesel	Emergency Power Generation	Visual Inspection	Monthly
798	AST	500	Diesel	Emergency Power Generation	Warrick Controls	Monthly
88	AST	500	Diesel	Emergency Power Generation	Warrick Controls	Monthly
PRT	AST	500	Diesel	Emergency Power Generation	Interstitial Monitor	Monthly

Table 3-13: Recommended and Frequency for Testing				
Type	**Frequency**	**Type Tank**	**Location of Records**	**Who Performs**
Bulk UST Modified Internal Inspection (API 653)	10 Years or recommended by previous API 653 Inspection	Bulk UST	Tank Manager's Office	DPW
AST & Associated Piping Visual Assessment (STI std. SP001-04 or equivalent)	Monthly	Category 1 Shop fabricated tanks & associated piping (0 to 5,000 gallons	Tank Manager's Office	Contractor Through DPW
AST & Associated Piping Visual Assessment (STI std. SP001-04 or equivalent)	Monthly and 20 Years Formal External	Category 1 Shop fabricated tanks & associated piping (greater than 5,001 gallons)	Tank Manager's Office	Contractor Through DPW
AST & Associated Piping Visual Assessment (STI std. SP001-04 or equivalent)	Monthly	Category 1 Portable Containers	Tank Manager's Office	Contractor Through DPW
Inspection & Calibration Leak Detection, Liquid Level Sensing & Overfill Prevention Devices (ATG, Float Gauges, High Level Alarms, HLCVs)	Annual	All	Tank Manager's Office	Contractor Through Facilities Maintenance or DPW
Underground AST Suction Piping (w/o LDS) Integrity (Tracer or other)	3 years	All AST underground suction piping without leak detection	Tank Manager's Office	Contractor Through DPW
Cathodic Protection Survey	3 years	All CP Systems	Tank Manager's Office	Contractor Through DPW

Table 3-14: Formal Assessments of Active Shop-Fabricated ASTs (STI SP001-04)													
Tank ID	**Tank Type**	**Status**	**Capacity (gallons)**	**Contents**	**Nearest Building**	**Facility**	**Installation Year**	**STI Inspection Category**	**STI Inspection Schedule**	**STI External Inspection Schedule**	**STI Internal Inspection Schedule**	**Last STI Formal Evaluation**	**Next STI Formal Evaluation**
1207	AST	Active	500	Diesel	1207	Unknown	1998	1	Periodic/External	20 Years	N/A	Unknown	2018
1758	AST	Active	500	Diesel	2019	Unknown (BOSC)	1970	1	Periodic/External	20 Years	N/A	Unknown	2011
1971-INT	AST-INT	Active	260	Diesel	1971	Unknown (BOSC)	Unknown	1	Periodic	N/A	N/A	Unknown	N/A
2021	AST	Active	500	Diesel	2021	Unknown (BOSC)	1982	1	Periodic/External	20 Years	N/A	Unknown	2011
2231-INT	AST-INT	Active	300	Diesel	2231	Unknown (BOSC)	Unknown	1	Periodic	N/A	N/A	Unknown	N/A
2248	AST	Active	5000	Diesel	2248	Unknown (BOSC)	1989	1	Periodic/External	20 Years	N/A	Unknown	2011
2303-2	AST	Active	500	Diesel	2303	Unknown (BOSC)	Unknown	1	Periodic/External	20 Years	N/A	Unknown	2011
2385-INT	AST-INT	Active	100	Diesel	2385	Unknown (BOSC)	Unknown	1	Periodic	N/A	N/A	Unknown	N/A
2406	AST	Active	500	Diesel	2406	Unknown (BOSC)	Unknown	1	Periodic/External	20 Years	N/A	Unknown	2011
2426	AST	Active	500	Diesel	2426	Unknown	Unknown	1	Periodic/External	20 Years	N/A	Unknown	2011
542	AST	Active	500	Diesel	542/2016	Unknown (BOSC)	1982	1	Periodic/External	20 Years	N/A	Unknown	2011
737	AST	Active	500	Diesel	737	Unknown (BOSC)	Unknown	1	Periodic/External	20 Years	N/A	Unknown	2011
784	AST	Active	150	Diesel	784	Unknown (BOSC)	Unknown	1	Periodic/External	20 Years	N/A	Unknown	2011

Table 3-15: Active PST Formal Electronic and Gauge Testing and Calibration											
Tank ID	**Tank Type**	**Status**	**Capacity (gallons)**	**Contents**	**Nearest Building**	**Facility**	**Liquid Level Gauge Type**	**Gauge Manufacturer**	**Gauge Model**	**Last Gauge Calibration**	**Next Gauge Calibration**
1090A	AST	Active	3000	Gasoline	2334	AAFES	Pop-up Display	Krueger	Unknown	Unknown	2011
1090B	AST	Active	2000	Diesel	2334	AAFES	Pop-up Display	Krueger	Unknown	Unknown	2011
1205	AST	Active	1000	Diesel	1205	Unknown (BOSC)	Pop-up Display	Krueger	Unknown	Unknown	2011
1207	AST	Active	500	Diesel	1207	Unknown	Numbered Wheel Display	Scully	Uni-Guage	Unknown	2011
124A	UST	Active	2500	Diesel	124	BOSC Fueling Station	Automatic Tank Gauge	Veeder-Root	TLS 350	2010	2011
124B	UST	Active	6000	Gasoline	124	BOSC Fueling Station	Automatic Tank Gauge	Veeder-Root	TLS 350	2010	2011
124C	UST	Active	6000	Gasoline	124	BOSC Fueling Station	Automatic Tank Gauge	Veeder-Root	TLS 350	2010	2011
1691	AST	Active	1000	Diesel	1691	Unknown (BOSC)	Visual Gauge/Automatic Tank Gauge	Krueger Pop-Up, Warrick Controls	DMS-572	Unknown	2011
1758	AST	Active	500	Diesel	2019	Unknown (BOSC)	Automatic Tank Gauge	Pneumecator	LC-1000	Unknown	2011
1817 A	AST	Active	5000	Diesel	1817	Unknown	Pop-up Display	Krueger	Unknown	Unknown	Unknown
1817 B	AST	Active	5000	Diesel	1817	Unknown	Pop-up Display	Krueger	Unknown	Unknown	Unknown
1920	AST	Active	500	Diesel	1920	Unknown (BOSC)	Pop-up Display	Krueger	Unknown	Unknown	2011
1971-INT	AST-INT	Active	260	Diesel	1971	Unknown (BOSC)	Pop-up Display	Krueger	Type D	Unknown	2011
2017	AST	Active	500	Diesel	2017	Unknown (BOSC)	Pop-up Display	Krueger	Unknown	Unknown	Unknown
2020	AST	Active	500	Diesel	2020	Unknown (BOSC)	Pop-up Display	Krueger	Unknown	Unknown	Unknown

Table 3-15: Active PST Formal Electronic and Gauge Testing and Calibration											
Tank ID	**Tank Type**	**Status**	**Capacity (gallons)**	**Contents**	**Nearest Building**	**Facility**	**Liquid Level Gauge Type**	**Gauge Manufacturer**	**Gauge Model**	**Last Gauge Calibration**	**Next Gauge Calibration**
2021	AST	Active	500	Diesel	2021	Unknown (BOSC)	Pop-up Display	Sentry	Unknown	Unknown	Unknown
2231-INT	AST-INT	Active	300	Diesel	2231	Unknown (BOSC)	Pop-up Display	Krueger	Type D	Unknown	2011
2248	AST	Active	5000	Diesel	2248	Unknown (BOSC)	Automatic Tank Gauge	Scully	Unknown	Unknown	2011
2293	UST	Active	4000	Diesel	2293	Unknown (BOSC)	Automatic Tank Gauge	Veeder-Root	TLS-350	Unknown	2011
2303-2	AST	Active	500	Diesel	2303	Unknown (BOSC)	Pop-up Display	Unknown	Unknown	Unknown	Unknown
2334-INT	AST-INT	Active	569	Diesel	2334	Unknown (BOSC)	Dial Gauge	Unknown	Unknown	Unknown	2011
2360	AST	Active	500	Diesel	2360	Unknown (BOSC)	Pop-up Display	Krueger	Unknown	Unknown	2011
2361	AST	Active	500	Diesel	2361	Unknown (BOSC)	Pop-up Display	Krueger	Unknown	Unknown	2011
2385-INT	AST-INT	Active	100	Diesel	2385	Unknown (BOSC)	Pop-up Display	Krueger	Type D	Unknown	2011
2394-INT	AST-INT	Active	200	Diesel	2394	Unknown (BOSC)	Dial Gauge	Unknown	Unknown	Unknown	2011
2406	AST	Active	500	Diesel	2406	Unknown (BOSC)	Pop-up Display	Krueger	Unknown	Unknown	2011
2426	AST	Active	500	Diesel	2426	Unknown	None	N/A	N/A	N/A	N/A
542	AST	Active	500	Diesel	542/2016	Unknown (BOSC)	None	N/A	N/A	N/A	N/A
737	AST	Active	500	Diesel	737	Unknown (BOSC)	Pop-up Display	Unknown	Unknown	Unknown	2011

Table 3-15: Active PST Formal Electronic and Gauge Testing and Calibration											
Tank ID	**Tank Type**	**Status**	**Capacity (gallons)**	**Contents**	**Nearest Building**	**Facility**	**Liquid Level Gauge Type**	**Gauge Manufacturer**	**Gauge Model**	**Last Gauge Calibration**	**Next Gauge Calibration**
784	AST	Active	150	Diesel	784	Unknown (BOSC)	Clock/Remote Display	Hersey	Junior Model	Unknown	2011
798	AST	Active	500	Diesel	798	Unknown (BOSC)	Pop-up Display	Unknown	Unknown	Unknown	2011
88	AST	Active	500	Diesel	88	Unknown (BOSC)	Pop-up Display	Unknown	Unknown	Unknown	2011
PRT	AST	Active	500	Diesel	737	Puerto Rico Telephone (Non-NAPR)	Pop-up Display	Krueger	Unknown	Unknown	N/A- Not Under NAPR

Table 3-16: Recommended Integrity Testing of Active Tank Underground Piping							
Tank ID	**Tank Type**	**Contents**	**Piping Exposure**	**Delivery System**	**Last Tightness Test**	**Next Tightness Test**	**Recommended Tightness Testing Schedule**
2293	UST	Diesel	Underground	Suction	Unknown	2011	Annual
124A*	UST	Gasoline	Underground	Suction	2010	2011	Annual
124B*	UST	Gasoline	Underground	Suction	2010	2011	Annual
124C*	UST	Diesel	Underground	Suction	2010	2011	Annual

* Tanks have active line leak detection.

4.0 REQUIRED UPGRADES AND BMP RECOMMENDATIONS

Table 4-1 (Active PSTs) and Table 4-2 (Inactive and Out of Service PSTs) identifies required upgrades to correct deficiencies that are necessary to bring a particular tank and/or generator facility into compliance with a federal, state, and local regulations. Both Tables also identify BMP recommendations based on good engineering practices that will enhance the operation, maintenance and management of those tanks and generator facilities listed.

Another issue relative to general compliance of all systems deals with 40 CFR 112 compliant loading/offloading areas for storage tanks. It is a requirement of 40 CFR 112.7 (c) that all regulated tanks have some type of discharge control for the loading of tanks or the fueling of vehicles. The sites that need containment structures at loading areas have not been determined to be “out of compliance” based solely on that requirement. However, as noted, containment measures should be verified and implemented immediately to avoid any potential environmental impacts.

Active PSTs with recommended piping upgrades can be found in Table 4-3.

Table 4-1: Active PST Required Upgrades								
Tank ID	**Tank Type**	**Capacity (gallons)**	**Contents**	**Nearest Building**	**Facility**	**40 CFR 112 Required Upgrades**	**40 CFR 280 Required Upgrades**	**BMP Recommendation**
1090A	AST	3000	Gasoline	2334	AAFES	Repair/replace tank gauges.	N/A	Provide spill kit. Paint piping for corrosion protection.
1090B	AST	2000	Diesel	2334	AAFES	None	N/A	Provide spill kit. Paint piping for corrosion protection.
1205	AST	1000	Diesel	1205	Unknown (BOSC)	None	N/A	Operations and maintenance on leak detection system.
1207	AST	500	Diesel	1207	Unknown	Recoat/repair secondary containment, replace missing fittings, provide lock for secondary containment valve.	N/A	Mark oil type. Operations and maintenance on leak detection system.
124A	UST	2500	Diesel	124	BOSC Fueling Station	N/A	None	Provide Spill Kit
124B	UST	6000	Gasoline	124	BOSC Fueling Station	N/A	None	Provide Spill Kit
124C	UST	6000	Gasoline	124	BOSC Fueling Station	N/A	None	Provide Spill Kit
1691	AST	1000	Diesel	1691	Unknown (BOSC)	None	N/A	Operations and maintenance on leak detection system
1758	AST	500	Diesel	2019	Unknown (BOSC)	Install overfill protection inside.	N/A	None
1817 A	AST	5000	Diesel	1817	Unknown	None	N/A	Repair/replace visual gauges. Operations and maintenance on leak detection system.
1817 B	AST	5000	Diesel	1817	Unknown	None	N/A	Repair/replace visual gauges. Operations and maintenance on leak detection system.
1920	AST	500	Diesel	1920	Unknown (BOSC)	None	N/A	Repair/Replace visual gauges. Operations and maintenance on leak detection system
1971-INT	AST-INT	260	Diesel	1971	Unknown (BOSC)	N/A	N/A	None
2017	AST	500	Diesel	2017	Unknown (BOSC)	Repair and repaint piping for corrosion protection or replace with a corrosion resistant material. Repair/Replace interstitial monitoring gauge.	N/A	None
2020	AST	500	Diesel	2020	Unknown (BOSC)	Repair and repaint piping for corrosion protection or replace with a corrosion resistant material. Repair/Replace main tank and interstitial monitoring gauge.	N/A	None
2021	AST	500	Diesel	2021	Unknown (BOSC)	None	N/A	None
2231-INT	AST-INT	300	Diesel	2231	Unknown (BOSC)	N/A	N/A	None
2248	AST	5000	Diesel	2248	Unknown (BOSC)	Enlarge secondary containment dike or confirm dike capacity is 110% tank capacity.	N/A	None
2293	UST	4000	Diesel	2293	Unknown (BOSC)	N/A	Perform tightness testing of underground pipe, since leak detection cannot be installed for pipe.	None
2303-2	AST	500	Diesel	2303	Unknown (BOSC)	Reroute piping so it does not compromise secondary containment and repair containment. Repair/replace pop-up gauge	N/A	Repair tank coating,

Table 4-1: Active PST Required Upgrades

Tank ID	Tank Type	Capacity (gallons)	Contents	Nearest Building	Facility	40 CFR 112 Required Upgrades	40 CFR 280 Required Upgrades	BMP Recommendation
2334-INT	AST-INT	569	Diesel	2334	Unknown (BOSC)	N/A	N/A	None
2360	AST	500	Diesel	2360	Unknown (BOSC)	None	N/A	Repair/Replace liquid level gauge, Operations and maintenance on leak detection system
2361	AST	500	Diesel	2361	Unknown (BOSC)	None	N/A	Operations and maintenance on leak detection system
2385-INT	AST-INT	100	Diesel	2385	Unknown (BOSC)	N/A	N/A	None
2394-INT	AST-INT	200	Diesel	2394	Unknown (BOSC)	N/A	N/A	Repair/replace hoses.
2406	AST	500	Diesel	2406	Unknown (BOSC)	Repair/replace visible gauge, provide locking mechanism for drainage valve. Piping corroded; repair/coat/replace piping.	N/A	None
2426	AST	500	Diesel	2426	Unknown	None	N/A	None
542	AST	500	Diesel	542/2016	Unknown (BOSC)	None	N/A	None
737	AST	500	Diesel	737	Unknown (BOSC)	Provide containment valve security.	N/A	None
784	AST	150	Diesel	784	Unknown (BOSC)	None	N/A	None
798	AST	500	Diesel	798	Unknown (BOSC)	None	N/A	None
88	AST	500	Diesel	88	Unknown (BOSC)	Repair/replace visual gauge.	N/A	None
PRT	AST	500	Diesel	737	Puerto Rico Telephone (Non-NAPR)	N/A	N/A	Note: N/A- Tank not under authority of NAPR

Table 4-2: Inactive and Closed PST Required Upgrades										
Tank ID	**Tank Type**	**Capacity (gallons)**	**Status**	**Contents**	**Nearest Building**	**Facility**	**Piping Recommendations**	**40 CFR 112 Required Upgrades**	**40 CFR 280 Required Upgrades**	**BMP Recommendation**
1080	AST Bunkered	1165000	Inactive	DFM	1982	Fuels Division	Install cathodic protection, integrity testing	Provide secondary containment & HLCV.	N/A	If made active: Operations and maintenance ATG and CP system.
1082	AST Bunkered	1165000	Inactive	DFM	1982	Fuels Division	Install cathodic protection, integrity testing	Provide secondary containment & HLCV.	N/A	If made active: Operations and maintenance ATG and CP system.
1084	AST Bunkered	1181000	Inactive	JP-5	1982	Fuels Division	Install cathodic protection, integrity testing	Provide secondary containment & HLCV.	N/A	If made active: Operations and maintenance ATG and CP system.
1086	AST Bunkered	1181000	Inactive	JP-5	1982	Fuels Division	Install cathodic protection, integrity testing	Provide secondary containment & HLCV.	N/A	If made active: Operations and maintenance ATG and CP system.
1088	AST Bunkered	425000	Inactive	JP-5	1987	Fuels Division	Install cathodic protection, integrity testing	Provide secondary containment & HLCV.	N/A	If made active: Operations and maintenance ATG and CP system.
1211	AST	5000	Closed	Diesel	1211	Unknown	N/A	None	N/A	Remove tank
1211A/B	AST	500/500	Closed	Diesel/Mogas	1211	Unknown	N/A	None	N/A	Remove tank
161	AST	500	Closed	Diesel	161	Unknown	N/A	None	N/A	Remove tank
1686	UST	10000	Closed	JP-5 Fuel	1686	FBI Building	N/A	N/A	None	Remove tank
1691-M	AST	5000	Inactive	Methanol	1691	Unknown (BOSC)	None	None	N/A	Operations and maintenance on leak detection system
1708-INT	AST-INT	75	Inactive	Diesel	1708	Unknown	N/A	N/A	N/A	Remove tank
1729	AST	2000	Closed	Diesel	1729	AFWTF	N/A	None	N/A	Remove tank
1758 M	AST	5000	Inactive	Methanol	1758	Unknown (BOSC)	None	None	N/A	Operations and maintenance on leak detection system
1796A	AST	250	Closed	Diesel	1796	Unknown	N/A	None	N/A	Remove tank
1796B	AST	500	Closed	Diesel	1796	Unknown	N/A	None	N/A	Remove tank
1808	AST	5000	Inactive	Diesel	1808	Unknown	None	Verify or provide area lighting.	N/A	Operations and maintenance on leak detection system. Provide marking for Oil type
1972	AST	250	Closed	Diesel	1972	Unknown	N/A	None	N/A	Remove tank
1982	UST	550	Closed	Waste Fuel	1982	Unknown	N/A	N/A		Remove tank
1995	AST	4200000	Inactive	DFM	N/A	Fuels Division	None	Repair containment, tightness test piping, lock secondary containment drainage valve.	N/A	If tank placed back into service: Operations and maintenance on ATG system and CP system. Add HLCV
1996	AST	4200000	Inactive	DFM	N/A	Fuels Division	None	Repair containment, tightness test piping, lock secondary containment drainage valve.	N/A	If tank placed back into service: Operations and maintenance on ATG system and CP system. Add HLCV
201	AST	500	Inactive	Used Oil	201	Unknown	None	None	N/A	Close or remove tank.
2021 M	AST	5000	Closed	Methanol	2021	Unknown (BOSC)	N/A	None	N/A	Remove tank
2037	UST	600	Closed	Diesel	2037	Unknown	N/A	N/A		Remove tank
212	AST Bunkered	50000	Inactive	Diesel	N/A	Fuels Division	Install cathodic protection, integrity testing	Install ATG- high level alarm/HLCV	N/A	Formal inspection and integrity test of the tank. Provide containment, & overfill catchment
213	AST Bunkered	50000	Inactive	Mogas	N/A	Fuels Division	Install cathodic protection, integrity testing	Install ATG- high level alarm/HLCV	N/A	Formal inspection and integrity test of the tank. Provide containment, & overfill catchment
214	AST Bunkered	248000	Inactive	DFM	N/A	Fuels Division	Install cathodic protection, integrity testing	Install ATG- high level alarm/HLCV	N/A	Formal inspection and integrity test of the tank. Provide containment, & overfill catchment

Table 4-2: Inactive and Closed PST Required Upgrades										
Tank ID	**Tank Type**	**Capacity (gallons)**	**Status**	**Contents**	**Nearest Building**	**Facility**	**Piping Recommendations**	**40 CFR 112 Required Upgrades**	**40 CFR 280 Required Upgrades**	**BMP Recommendation**
215	AST Bunkered	245000	Inactive	DFM	N/A	Fuels Division	Install cathodic protection, integrity testing	Install ATG- high level alarm/HLCV	N/A	Formal inspection and integrity test of the tank. Provide containment, & overfill catchment
216	AST Bunkered	247000	Inactive	DFM	N/A	Fuels Division	Install cathodic protection, integrity testing	Install ATG- high level alarm/HLCV	N/A	Formal inspection and integrity test of the tank. Provide containment, & overfill catchment
217	AST Bunkered	245000	Inactive	DFM	N/A	Fuels Division	Install cathodic protection, integrity testing	Install ATG- high level alarm/HLCV	N/A	Formal inspection and integrity test of the tank. Provide containment, & overfill catchment
2191	AST	12000	Inactive	Diesel	2191	Unknown	N/A	None	N/A	Close/Remove tank.
2232-INT	AST-INT	500	Inactive	Diesel	2232	Unknown	N/A	N/A	N/A	Close/Remove tank.
2234-INT	AST-INT	60	Inactive	Diesel	2234	Unknown	N/A	N/A	N/A	Close/Remove tank.
2270	AST	4200000	Inactive	JP-5	N/A	Fuels Division	Integrity testing	Repair secondary containment.	N/A	Before tank is active: inspection and calibration of ATG system, inspection of Cathodic Protection system, and add HLCV.
2271	AST	4200000	Inactive	JP-5	N/A	Fuels Division	Integrity testing	Repair secondary containment.	N/A	Before tank is active:, inspection and calibration of ATG system, inspection of Cathodic Protection system, and add HLCV.
2272	AST	4200000	Inactive	JP-5	N/A	Fuels Division	Integrity testing	Repair secondary containment.	N/A	Before tank is active: inspection and calibration of ATG system, inspection of Cathodic Protection system, and add HLCV.
2273	AST	4267000	Inactive	JP-5	2273	Fuels Division	Integrity testing	Repair secondary containment.	N/A	Before tank is active: inspection and calibration of ATG system, inspection of Cathodic Protection system, and add HLCV.
2274	AST	4200000	Inactive	JP-5	N/A	Fuels Division	Integrity testing	Repair secondary containment.	N/A	Before tank is active: inspection and calibration of ATG system, inspection of Cathodic Protection system, and add HLCV.
2303-1	AST	1000	Inactive	Diesel	2303	Unknown	None	None	N/A	Provide markings for oil type. Close or remove tank
2304	UST	4000	Closed	Diesel	2304	Unknown	N/A	N/A	None	Remove tank.
2339A	UST	10000	Inactive	Gasoline	2339	Unknown	Install/Verify leak detection, integrity test	N/A	Unknown	Close/Remove tank. Operations and maintenance on ATG.
2339B	UST	10000	Inactive	Gasoline	2339	Unknown	Install/Verify leak detection, integrity test	N/A	Unknown	Close/Remove tank. Operations and maintenance on ATG.
2339C	UST	10000	Inactive	Gasoline	2339	Unknown	Install/Verify leak detection, integrity test	N/A	Unknown	Close/Remove tank. Operations and maintenance on ATG.
2339D	AST	500	Inactive	Diesel	2339	Unknown	None	Increase capacity of containment	N/A	Before tank is active: repair tank coating, replace level gauge.
2339E	UST	500	Inactive	Used Oil	2339	Unknown	Install/Verify leak detection, integrity test	N/A	Unknown	Close/Remove tank. Operations and maintenance on ATG.
2344-INT	AST-INT	500	Inactive	Diesel	2344	Unknown	N/A	N/A	N/A	Close/Remove tank.
2357	AST	1000	Closed	Diesel	2357	Unknown	N/A	None	N/A	Remove tank.
2362-INT	AST-INT	458	Inactive	Diesel	2362	Unknown	N/A	N/A	N/A	Close/Remove tank.
2407	AST	1000	Closed	Diesel	2407	Unknown (BOSC)	N/A	None	N/A	Remove tank

Table 4-2: Inactive and Closed PST Required Upgrades										
Tank ID	Tank Type	Capacity (gallons)	Status	Contents	Nearest Building	Facility	Piping Recommendations	40 CFR 112 Required Upgrades	40 CFR 280 Required Upgrades	BMP Recommendation
2437	AST	4200000	Inactive	DFM	N/A	Fuels Division	Integrity testing	Verify containment	N/A	Before tank is active: Tightness testing on tank and piping system, inspection, Operations and maintenance on the leak detection system, ATG, CP systems.
2439-INT	AST-INT	500	Inactive	Diesel	2439	Unknown	N/A	N/A	N/A	Remove tank
296	AST	500	Closed	Diesel	296	Unknown	N/A	None	N/A	Remove tank
3176	UST	1000	Closed	Diesel	3176	Camp Moscrip	N/A	N/A	Unknown	Remove tank
3178	UST	1000	Closed	Diesel	3178	Camp Moscrip	N/A	N/A	Unknown	Remove tank
3179	UST	1000	Closed	Diesel	3179	Camp Moscrip	N/A	N/A	Unknown	Remove tank
3180	UST	1000	Closed	Diesel	3180	Camp Moscrip	N/A	N/A	Unknown	Remove tank
3181	UST	1000	Closed	Diesel	3181	Camp Moscrip	N/A	N/A	Unknown	Remove tank
31B	AST	1000	Closed	Used Oil	31	Unknown	N/A	None	N/A	Remove tank
31F	AST	1000	Closed	Diesel	31	Unknown	N/A	None	N/A	Remove tank
381	AST Bunkered	1180000	Inactive	JP-5	N/A	Fuels Division	Integrity testing	Verify containment	N/A	Before tank active: tightness test tank and piping, Operations and maintenance on the ATG & CP. Add HLCV
500	AST	1000	Closed	Diesel	500	Unknown	N/A	N/A	N/A	Remove tank
519	AST	250	Inactive	Diesel	519	Unknown	None	Verify liquid level gauge	N/A	Close/Remove tank.
56C	AST	5000	Closed	Used Oil	1982	Unknown	N/A	None	N/A	Remove tank
729	AST	1000	Closed	Diesel	729	Unknown	N/A	None	N/A	Remove tank
731	AST	1000	Closed	Diesel	731	Unknown	N/A	None	N/A	Remove tank
732	AST	1000	Closed	Diesel	732	Unknown	N/A	None	N/A	Remove tank
733	AST	1000	Closed	Diesel	733	Unknown	N/A	None	N/A	Remove tank
734	AST	1000	Closed	Diesel	734	Unknown	N/A	None	N/A	Remove tank
82	AST Bunkered	2115000	Inactive	DFM	N/A	Fuels Division	Install cathodic protection, integrity testing	Verify/provide secondary containment. Provide overfill catchment, and automatic overfill prevention.	N/A	Before tank is active: Operations and maintenance on ATG and High level alarms
83	AST Bunkered	1157000	Inactive	DFM	1982	Fuels Division	Install cathodic protection, integrity testing	Verify/provide secondary containment. Provide overfill catchment, and automatic overfill prevention.	N/A	Before tank is active: Operations and maintenance on ATG and High level alarms
84	AST Bunkered	585000	Inactive	JP-5	1982	Fuels Division	Install cathodic protection, integrity testing	Verify/provide secondary containment. Provide overfill catchment, and automatic overfill prevention.	N/A	Before tank is active: Operations and maintenance on ATG and High level alarms
85	AST Bunkered	1134000	Inactive	JP-5	1982	Fuels Division	Install cathodic protection, integrity testing	Verify/provide secondary containment. Provide overfill catchment, and automatic overfill prevention.	N/A	Before tank is active: Operations and maintenance on ATG and High level alarms
BOWTS-1	AST	50000	Inactive	Oily Waste Water	2252	Unknown	None	None	N/A	Before tank is active: Full system inspection

Table 4-2: Inactive and Closed PST Required Upgrades										
Tank ID	**Tank Type**	**Capacity (gallons)**	**Status**	**Contents**	**Nearest Building**	**Facility**	**Piping Recommendations**	**40 CFR 112 Required Upgrades**	**40 CFR 280 Required Upgrades**	**BMP Recommendation**
BOWTS-2	AST	50000	Inactive	Oily Waste Water	2252	Unknown	None	None	N/A	Before tank is active: Full system inspection
BOWTS-3	AST	1000	Inactive	Used Oil	2252	Unknown	None	None	N/A	Before tank is active: Full system inspection
BOWTS-4	AST	1000	Inactive	Used Oil	2252	Unknown	None	None	N/A	Before tank is active: Full system inspection
BOWTS-5	AST	1000	Inactive	Used Oil	2252	Unknown	None	None	N/A	Before tank is active: Full system inspection
ROTHR-1	AST	300	Inactive	Diesel	ROTHR	AFWTF	Unknown	Unknown	N/A	Before tank is active: Full system inspection
ROTHR-2	AST	300	Inactive	Diesel	ROTHR	AFWTF	Unknown	Unknown	N/A	Replace missing fittings
ROTHR-3	AST	250	Inactive	Diesel	ROTHR	AFWTF	Unknown	Unknown	N/A	None
ROTHR-4	AST	250	Inactive	Diesel	ROTHR	AFWTF	Unknown	Unknown	N/A	Provide marking for oil type

Table 4-3: Active PST Recommended Piping											
Tank ID	**Capacity (gallons)**	**Contents**	**Nearest Building**	**Pipe Construction Material**	**Pipe Length**	**Delivery System**	**Piping Exposure**	**Piping Leak Detection**	**Pipe Corrosion Protection**	**Pressurized Piping Line Leak Detectors**	**Piping Recommendations**
1090A	3000	Gasoline	2334	SW Steel	14'	Suction	Aboveground	Visible Inspection	None	N/A	Paint piping for corrosion protection.
1090B	2000	Diesel	2334	SW Steel	12'	Suction	Aboveground	Visual Inspection	None	N/A	Paint piping for corrosion protection.
1205	1000	Diesel	1205	SW Steel	22't	Suction	Aboveground	Visible Inspection	Paint	N/A	None
1207	500	Diesel	1207	SW Copper	20'	Suction	Aboveground	Visible Inspection	Paint	N/A	None
124A	2500	Diesel	124	Unknown	Unknown	Pressure	Underground	Veeder-Root	Unknown	Yes	None
124B	6000	Gasoline	124	Unknown	Unknown	Pressure	Underground	Veeder-Root	Unknown	Yes	None
124C	6000	Gasoline	124	Unknown	Unknown	Pressure	Underground	Veeder-Root	Unknown	Yes	None
1691	1000	Diesel	1691	SW Copper	35'	Suction	Aboveground	None	Corrosion Resistant Material	N/A	None
1758	500	Diesel	2019	SW Steel	12'	Suction	Aboveground	Visible Inspection	Paint	N/A	None
1817 A	5000	Diesel	1817	SW Steel	Unknown	Suction	Aboveground	Visible Inspection	Paint	N/A	None Note: Piping runs through containment trough through concrete sidewalk.
1817 B	5000	Diesel	1817	SW Steel	Unknown	Suction	Aboveground	Visible Inspection	Paint	N/A	None Note: Piping runs through containment trough through concrete sidewalk.
1920	500	Diesel	1920	SW Copper	Unknown	Suction	Aboveground	Visible Inspection	Corrosion Resistant Material/Painted	N/A	None
1971-INT	260	Diesel	1971	Rubber	Unknown	Suction	N/A	Visual Inspection	Corrosion Resistant Material	N/A	None
2017	500	Diesel	2017	SW Steel	22'	Suction	Aboveground	Visible Inspection	None	N/A	Repair and repaint piping for corrosion protection or replace with a corrosion resistant material.
2020	500	Diesel	2020	SW Steel	28'	Suction	Aboveground	Visible Inspection	None	N/A	Repair and repaint piping for corrosion protection or replace with a corrosion resistant material.
2021	500	Diesel	2021	SW Steel	12"	Suction	Aboveground	Visible Inspection	Paint	N/A	None
2231-INT	300	Diesel	2231	Rubber	Unknown	Suction	Aboveground	Visual Inspection	Corrosion Resistant Material	N/A	None
2248	5000	Diesel	2248	Steel	Unknown	Suction	Aboveground	None	None	N/A	None
2293	4000	Diesel	2293	Unknown	Unknown	Suction	Underground	None	Unknown	N/A	Perform tightness testing of underground pipe, since leak detection cannot be installed for pipe.
2303-2	500	Diesel	2303	Copper	Unknown	Suction	Aboveground	Visible Inspection	Corrosion Resistant Material	N/A	Reroute piping so it does not compromise secondary containment and repair containment.
2334-INT	569	Diesel	2334	Rubber	Unknown	Suction	Aboveground	Visual Inspection	Corrosion Resistant Material	N/A	None
2360	500	Diesel	2360	SW Copper	20'	Suction	Aboveground	Visible Inspection	Corrosion Resistant Material	N/A	None
2361	500	Diesel	2361	SW Copper	Unknown	Suction	Aboveground	Visible Inspection	Paint	N/A	None
2385-INT	100	Diesel	2385	Rubber	Unknown	Suction	N/A	Visual Inspection	Corrosion Resistant Material	N/A	None
2394-INT	200	Diesel	2394	Rubber	Unknown	Suction	N/A	N/A	Corrosion Resistant Material	N/A	Repair/replace hoses.

Table 4-3: Active PST Recommended Piping

Tank ID	Capacity (gallons)	Contents	Nearest Building	Pipe Construction Material	Pipe Length	Delivery System	Piping Exposure	Piping Leak Detection	Pipe Corrosion Protection	Pressurized Piping Line Leak Detectors	Piping Recommendations
2406	500	Diesel	2406	SW Steel	Unknown	Suction	Underground	None	None	N/A	Repair and repaint piping for corrosion protection or replace with a corrosion resistant material.
2426	500	Diesel	2426	SW Copper	10'	Suction	Aboveground	Visual Inspection	Corrosion Resistant Material	N/A	None
542	500	Diesel	542/2016	SW Steel	14'	Suction	Aboveground	Visible Inspection	Paint	N/A	None
737	500	Diesel	737	SW Steel	Unknown	Suction	Aboveground	None	Paint	N/A	None
784	150	Diesel	784	Steel, (inside PVC)	Unknown	Suction	Aboveground	Visual Inspection	Paint	N/A	None
798	500	Diesel	798	SW Copper	Unknown	Suction	Aboveground	Visible Inspection	Corrosion Resistant Material	N/A	None
88	500	Diesel	88	SW Copper	Unknown	Suction	Aboveground	Visible Inspection	Corrosion Resistant Material	N/A	None
PRT	500	Diesel	737	SW Steel	Unknown	Suction	Aboveground	None	None	N/A	None

5.0 GLOSSARY

The following definitions are either commonly used definitions or are plain English interpretations of regulatory definitions. They are simplistic and are intended to convey only the information the average Navy installation needs to know.

ABOVEGROUND TANK OR ABOVEGROUND STORAGE TANK (AST): A tank entirely above grade (natural or otherwise).

(Note: for purposes of the SPCC regulation, the EPA arbitrarily defines partially buried, bunkered, and subterranean vaulted tanks as aboveground tanks.)

BREAKOUT TANK: A tank used only to control surges or flow in a DOT-regulated pipeline facility; they are not SPCC-regulated since the DOT regulates them.

BULK STORAGE CONTAINER: Any container of "oil" including storage tanks, transformers, and all other equipment containing greater than 55-gallons of oil.

BUNKERED TANK: A partially-buried tank covered by a mound of earth (i.e., a tank whose bottom is below grade (natural or otherwise), but whose top is covered with earth above grade).

FACILITY: Any mobile or fixed building, structure, equipment, or piping.

FUEL TRUCK PARKING AREA: Any permanent or temporary area used for storage of tanker trucks regardless of size. Loading and unloading racks are considered Fuel Truck Parking Areas. Not all Fuel Truck Parking Areas are loading/unloading racks.

HARMFUL QUANTITIES: For all practical purposes, any amount that causes a sheen on the water.

LARGE FACILITY: A facility whose SPCC-regulated storage capacity is 42,000 gallons or more.

NAVIGABLE WATERS: For all practical purposes, any body of water (e.g., ocean, lake, river, stream, slough, pond, mudflat) or its tributaries or adjacent wetlands.

OIL: A catch-all term primarily for petroleum and its refined products (e.g., Mogas, diesel, jet fuel, and lube oils), but also for vegetable oil, mineral oil, sludge, and oil mixed with any wastes except dredge spoils.

PARTIALLY BURIED TANK: A tank whose bottom is below grade (natural or otherwise), but whose top is exposed to the elements above grade.

PERMANENTLY CLOSED: A tank or facility closed in accordance with the following:

- All liquid and sludge has been removed from both the tank and its connecting lines;
- Explosive vapor has been eliminated down less than 25% of the former contents' lower explosive limit;
- Explosive vapor remains lower than the lower explosive limit;
- All connecting lines are blanked off;
- All valves are closed and locked; and
- Conspicuous signs are posted on the tank warning that it is PERMANENTLY closed and that vapors above the lower explosive limit are not present.

PIPELINE: Pipe regulated by the DOT's Office of Pipeline Safety (in general, pipe leaving the contiguous property of a Navy facility).

PIPING: Pipe NOT regulated by the DOT's Office of Pipeline Safety (in general, pipe staying on the contiguous property of a Navy facility).

PROPOSED SPCC-REGULATED TANK: Any tank in the following categories that is not permanently closed (as defined above):

- Aboveground storage tanks (as defined above) (except those used to control surges or flow in a DOT-regulated pipeline); and
- Fully buried USTs such as the following not regulated by 40 CFR 280:
  - Field-constructed (most USTs larger than 30,000 gallons)
  - Holding 110 gallons or less
  - Part of airport hydrant fuel distribution system
  - Acting as emergency spill or overflow tank

SMALLER FACILITY: A facility whose SPCC-regulated storage capacity is less than 42,000 gallons.

STORAGE CAPACITY: The size of a tank (as opposed to how much it might currently be holding).

SUBTERRANEAN VAULTED TANK: An aboveground tank in an underground vault (i.e., a tank above the artificial grade of a vault which is below the natural grade).

UNDERGROUND TANK OR UNDERGROUND STORAGE TANK (UST): A tank completely buried by earth.

APPENDIX A
REGULATIONS

Electronic Code e-CFR Data is current as of February 26, 2007

Title 40: Protection of Environment

PART 112—OIL POLLUTION PREVENTION

Section Contents

Subpart A—Applicability, Definitions, and General Requirements for All Facilities and All Types of Oils

Subpart B—Requirements for Petroleum Oils and Non-Petroleum Oils, Except Animal Fats and Oils and Greases, and Fish and Marine Mammal Oils; and Vegetable Oils (Including Oils from Seeds, Nuts, Fruits, and Kernels)

Subpart C—Requirements for Animal Fats and Oils and Greases, and Fish and Marine Mammal Oils; and for Vegetable Oils, including Oils from Seeds, Nuts, Fruits, and Kernels.

Authority: 33 U.S.C. 1251 et seq.; 33 U.S.C. 2720; E.O. 12777 (October 18, 1991), 3 CFR, 1991 Comp., p. 351.
Source: 38 FR 34165, Dec. 11, 1973, unless otherwise noted.
Editorial Note: Nomenclature changes to part 112 appear at 65 FR 40798, June 30, 2000.

Subpart A—Applicability, Definitions, and General Requirements for All Facilities and All Types of Oils

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Source: 67 FR 47140, July 17, 2002, unless otherwise noted.

§ 112.1 General applicability.

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(a)(1) This part establishes procedures, methods, equipment, and other requirements to prevent the discharge of oil from non-transportation-related onshore and offshore facilities into or upon the navigable waters of the United States or adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson Fishery Conservation and Management Act).

(2) As used in this part, words in the singular also include the plural and words in the masculine gender also include the feminine and vice versa, as the case may require.

(b) Except as provided in paragraph (d) of this section, this part applies to any owner or operator of a non-transportation-related onshore or offshore facility engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing, using, or consuming oil and oil products, which due to its location, could reasonably be expected to discharge oil in quantities that may be harmful, as described in part 110 of this chapter, into or upon the navigable waters of the United States or adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson Fishery Conservation and Management Act) that has oil in:

(1) Any aboveground container;

(2) Any completely buried tank as defined in §112.2;

(3) Any container that is used for standby storage, for seasonal storage, or for temporary storage, or not otherwise “permanently closed” as defined in §112.2;

(4) Any “bunkered tank” or “partially buried tank” as defined in §112.2, or any container in a vault, each of which is considered an aboveground storage container for purposes of this part.

(c) As provided in section 313 of the Clean Water Act (CWA), departments, agencies, and instrumentalities of the Federal government are subject to this part to the same extent as any person.

(d) Except as provided in paragraph (f) of this section, this part does not apply to:

(1) The owner or operator of any facility, equipment, or operation that is not subject to the jurisdiction of the Environmental Protection Agency (EPA) under section 311(j)(1)(C) of the CWA, as follows:

(i) Any onshore or offshore facility, that due to its location, could not reasonably be expected to have a discharge as described in paragraph (b) of this section. This determination must be based solely upon consideration of the geographical and location aspects of the facility (such as proximity to navigable waters or adjoining shorelines, land contour, drainage, etc.) and must exclude consideration of manmade features such as dikes, equipment or other structures, which may serve to restrain, hinder, contain, or otherwise prevent a discharge as described in paragraph (b) of this section.

(ii) Any equipment, or operation of a vessel or transportation-related onshore or offshore facility which is subject to the authority and control of the U.S. Department of Transportation, as defined in the Memorandum of Understanding between the Secretary of Transportation and the Administrator of EPA, dated November 24, 1971 (Appendix A of this part).

(iii) Any equipment, or operation of a vessel or onshore or offshore facility which is subject to the authority and control of the U.S. Department of Transportation or the U.S. Department of the Interior, as defined in the Memorandum of Understanding between the Secretary of Transportation, the Secretary of the Interior, and the Administrator of EPA, dated November 8, 1993 (Appendix B of this part).

(2) Any facility which, although otherwise subject to the jurisdiction of EPA, meets both of the following requirements:

(i) The completely buried storage capacity of the facility is 42,000 gallons or less of oil. For purposes of this exemption, the completely buried storage capacity of a facility excludes the capacity of a completely buried tank, as defined in §112.2, and connected underground piping, underground ancillary equipment, and containment systems, that is currently subject to all of the technical requirements of part 280 of this chapter or all of the technical requirements of a State program approved under part 281 of this chapter. The completely buried storage capacity of a facility also excludes the capacity of a container that is “permanently closed,” as defined in §112.2.

(ii) The aggregate aboveground storage capacity of the facility is 1,320 gallons or less of oil. For the purposes of this exemption, only containers with a capacity of 55 gallons or greater are counted. The aggregate aboveground storage capacity of a facility excludes the capacity of a container that is “permanently closed,” and the capacity of a “motive power container” as defined in §112.2.

(3) Any offshore oil drilling, production, or workover facility that is subject to the notices and regulations of the Minerals Management Service, as specified in the Memorandum of Understanding between the Secretary of Transportation, the Secretary of the Interior, and the Administrator of EPA, dated November 8, 1993 (Appendix B of this part).

(4) Any completely buried storage tank, as defined in §112.2, and connected underground piping, underground ancillary equipment, and containment systems, at any facility, that is subject to all of the technical requirements of part 280 of this chapter or a State program approved under part 281 of this chapter, except that such a tank must be marked on the facility diagram as provided in §112.7(a)(3), if the facility is otherwise subject to this part.

(5) Any container with a storage capacity of less than 55 gallons of oil.

(6) Any facility or part thereof used exclusively for wastewater treatment and not used to satisfy any requirement of this part. The production, recovery, or recycling of oil is not wastewater treatment for purposes of this paragraph.

(7) Any “motive power container,” as defined in §112.2. The transfer of fuel or other oil into a motive power container at an otherwise regulated facility is not eligible for this exemption.

(e) This part establishes requirements for the preparation and implementation of Spill Prevention, Control, and Countermeasure (SPCC) Plans. SPCC Plans are designed to complement existing laws, regulations, rules, standards, policies, and procedures pertaining to safety standards, fire prevention, and pollution prevention rules. The purpose of an SPCC Plan is to form a comprehensive Federal/State spill prevention program that minimizes the potential for discharges. The SPCC Plan must address all relevant spill prevention, control, and countermeasures necessary at the specific facility. Compliance with this part does not in any way relieve the owner or operator of an onshore or an offshore facility from compliance with other Federal, State, or local laws.

(f) Notwithstanding paragraph (d) of this section, the Regional Administrator may require that the owner or operator of any facility subject to the jurisdiction of EPA under section 311(j) of the CWA prepare and implement an SPCC Plan, or any applicable part, to carry out the purposes of the CWA.

(1) Following a preliminary determination, the Regional Administrator must provide a written notice to the owner or operator stating the reasons why he must prepare an SPCC Plan, or applicable part. The Regional Administrator must send such notice to the owner or operator by certified mail or by personal delivery. If the owner or operator is a corporation, the Regional Administrator must also mail a copy of such notice to the registered agent, if any and if known, of the corporation in the State where the facility is located.

(2) Within 30 days of receipt of such written notice, the owner or operator may provide information and data and may consult with the Agency about the need to prepare an SPCC Plan, or applicable part.

(3) Within 30 days following the time under paragraph (b)(2) of this section within which the owner or operator may provide information and data and consult with the Agency about the need to prepare an SPCC Plan, or applicable part, the Regional Administrator must make a final determination regarding whether the owner or operator is required to prepare and implement an SPCC Plan, or applicable part. The Regional Administrator must send the final determination to the owner or operator by certified mail or by personal delivery. If the owner or operator is a corporation, the Regional Administrator must also mail a copy of the final determination to the registered agent, if any and if known, of the corporation in the State where the facility is located.

(4) If the Regional Administrator makes a final determination that an SPCC Plan, or applicable part, is necessary, the owner or operator must prepare the Plan, or applicable part, within six months of that final determination and implement the Plan, or applicable part, as soon as possible, but not later than one year after the Regional Administrator has made a final determination.

(5) The owner or operator may appeal a final determination made by the Regional Administrator requiring preparation and implementation of an SPCC Plan, or applicable part, under this paragraph. The owner or operator must make the appeal to the Administrator of EPA within 30 days of receipt of

the final determination under paragraph (b)(3) of this section from the Regional Administrator requiring preparation and/or implementation of an SPCC Plan, or applicable part. The owner or operator must send a complete copy of the appeal to the Regional Administrator at the time he makes the appeal to the Administrator. The appeal must contain a clear and concise statement of the issues and points of fact in the case. In the appeal, the owner or operator may also provide additional information. The additional information may be from any person. The Administrator may request additional information from the owner or operator. The Administrator must render a decision within 60 days of receiving the appeal or additional information submitted by the owner or operator and must serve the owner or operator with the decision made in the appeal in the manner described in paragraph (f)(1) of this section.

[67 FR 47140, July 17, 2002, as amended at 71 FR 77290, Dec. 26, 2006]

§ 112.2 Definitions.

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For the purposes of this part:

Adverse weather means weather conditions that make it difficult for response equipment and personnel to clean up or remove spilled oil, and that must be considered when identifying response systems and equipment in a response plan for the applicable operating environment. Factors to consider include significant wave height as specified in Appendix E to this part (as appropriate), ice conditions, temperatures, weather-related visibility, and currents within the area in which the systems or equipment is intended to function.

Alteration means any work on a container involving cutting, burning, welding, or heating operations that changes the physical dimensions or configuration of the container.

Animal fat means a non-petroleum oil, fat, or grease of animal, fish, or marine mammal origin.

Breakout tank means a container used to relieve surges in an oil pipeline system or to receive and store oil transported by a pipeline for reinjection and continued transportation by pipeline.

Bulk storage container means any container used to store oil. These containers are used for purposes including, but not limited to, the storage of oil prior to use, while being used, or prior to further distribution in commerce. Oil-filled electrical, operating, or manufacturing equipment is not a bulk storage container.

Bunkered tank means a container constructed or placed in the ground by cutting the earth and re-covering the container in a manner that breaks the surrounding natural grade, or that lies above grade, and is covered with earth, sand, gravel, asphalt, or other material. A bunkered tank is considered an aboveground storage container for purposes of this part.

Completely buried tank means any container completely below grade and

covered with earth, sand, gravel, asphalt, or other material. Containers in vaults, bunkered tanks, or partially buried tanks are considered aboveground storage containers for purposes of this part.
Complex means a facility possessing a combination of transportation-related and non-transportation-related components that is subject to the jurisdiction of more than one Federal agency under section 311(j) of the CWA.
Contiguous zone means the zone established by the United States under Article 24 of the Convention of the Territorial Sea and Contiguous Zone, that is contiguous to the territorial sea and that extends nine miles seaward from the outer limit of the territorial area.
Contract or other approved means means:
(1) A written contractual agreement with an oil spill removal organization that identifies and ensures the availability of the necessary personnel and equipment within appropriate response times; and/or
(2) A written certification by the owner or operator that the necessary personnel and equipment resources, owned or operated by the facility owner or operator, are available to respond to a discharge within appropriate response times; and/or
(3) Active membership in a local or regional oil spill removal organization that has identified and ensures adequate access through such membership to necessary personnel and equipment to respond to a discharge within appropriate response times in the specified geographic area; and/or

(4) Any other specific arrangement approved by the Regional Administrator upon request of the owner or operator.
Discharge includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping of oil, but excludes discharges in compliance with a permit under section 402 of the CWA; discharges resulting from circumstances identified, reviewed, and made a part of the public record with respect to a permit issued or modified under section 402 of the CWA, and subject to a condition in such permit; or continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under section 402 of the CWA, that are caused by events occurring within the scope of relevant operating or treatment systems. For purposes of this part, the term discharge shall not include any discharge of oil that is authorized by a permit issued under section 13 of the River and Harbor Act of 1899 (33 U.S.C. 407).
Facility means any mobile or fixed, onshore or offshore building, structure, installation, equipment, pipe, or pipeline (other than a vessel or a public vessel) used in oil well drilling operations, oil production, oil refining, oil storage, oil gathering, oil processing, oil transfer, oil distribution, and waste treatment, or in which oil is used, as described in Appendix A to this part. The boundaries of a facility depend on several site-specific factors, including, but not limited to, the ownership or operation of buildings, structures, and equipment on the same site and the types of activity at the site.
Farm means a facility on a tract of land devoted to the production of crops or raising of animals, including fish, which produced and sold, or normally would have produced and sold, $1,000 or more of agricultural products during a year.

Fish and wildlife and sensitive environments means areas that may be identified by their legal designation or by evaluations of Area Committees (for planning) or members of the Federal On-Scene Coordinator's spill response structure (during responses). These areas may include wetlands, National and State parks, critical habitats for endangered or threatened species, wilderness and natural resource areas, marine sanctuaries and estuarine reserves, conservation areas, preserves, wildlife areas, wildlife refuges, wild and scenic rivers, recreational areas, national forests, Federal and State lands that are research national areas, heritage program areas, land trust areas, and historical and archaeological sites and parks. These areas may also include unique habitats such as aquaculture sites and agricultural surface water intakes, bird nesting areas, critical biological resource areas, designated migratory routes, and designated seasonal habitats.
Injury means a measurable adverse change, either long- or short-term, in the chemical or physical quality or the viability of a natural resource resulting either directly or indirectly from exposure to a discharge, or exposure to a product of reactions resulting from a discharge.
Maximum extent practicable means within the limitations used to determine oil spill planning resources and response times for on-water recovery, shoreline protection, and cleanup for worst case discharges from onshore non-transportation-related facilities in adverse weather. It includes the planned capability to respond to a worst case discharge in adverse weather, as contained in a response plan that meets the requirements in §112.20 or in a specific plan approved by the Regional Administrator.
Mobile refueler means a bulk storage container onboard a vehicle or towed, that is designed or used solely to store and transport fuel for transfer into or from an aircraft, motor vehicle, locomotive, vessel, ground service equipment, or other oil storage container.
Motive power container means any onboard bulk storage container used primarily to power the movement of a motor vehicle, or ancillary onboard oil-filled operational equipment. An onboard bulk storage container which is used to store or transfer oil for further distribution is not a motive power container. The definition of motive power container does not include oil drilling or workover equipment, including rigs.
Navigable waters means the waters of the United States, including the territorial seas.
(1) The term includes:
(i) All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide;
(ii) All interstate waters, including interstate wetlands;
(iii) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters:
(A) That are or could be used by interstate or foreign travelers for recreational or other purposes; or
(B) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or,

(C) That are or could be used for industrial purposes by industries in interstate commerce;
(iv) All impoundments of waters otherwise defined as waters of the United States under this section;
(v) Tributaries of waters identified in paragraphs (1)(i) through (iv) of this definition;
(vi) The territorial sea; and
(vii) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraph (1) of this definition.
(2) Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds which also meet the criteria of this definition) are not waters of the United States. Navigable waters do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with EPA.
Non-petroleum oil means oil of any kind that is not petroleum-based, including but not limited to: Fats, oils, and greases of animal, fish, or marine mammal origin; and vegetable oils, including oils from seeds, nuts, fruits, and kernels.
Offshore facility means any facility of any kind (other than a vessel or public vessel) located in, on, or under any of the navigable waters of the United States, and any facility of any kind that is subject to the jurisdiction of the United States and is located in, on, or under any other waters.
Oil means oil of any kind or in any form, including, but not limited to: fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and, other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil.
Oil-filled operational equipment means equipment that includes an oil storage container (or multiple containers) in which the oil is present solely to support the function of the apparatus or the device. Oil-filled operational equipment is not considered a bulk storage container, and does not include oil-filled manufacturing equipment (flow-through process). Examples of oil-filled operational equipment include, but are not limited to, hydraulic systems, lubricating systems (e.g., those for pumps, compressors and other rotating equipment, including pumpjack lubrication systems), gear boxes, machining coolant systems, heat transfer systems, transformers, circuit breakers, electrical switches, and other systems containing oil solely to enable the operation of the device.
Oil Spill Removal Organization means an entity that provides oil spill response resources, and includes any for-profit or not-for-profit contractor, cooperative, or in-house response resources that have been established in a geographic area to provide required response resources.
Onshore facility means any facility of any kind located in, on, or under any land within the United States, other than submerged lands.
Owner or operator means any person owning or operating an onshore facility or an offshore facility, and in the case of any abandoned offshore facility, the person who owned or operated or maintained the facility

immediately prior to such abandonment.
Partially buried tank means a storage container that is partially inserted or constructed in the ground, but not entirely below grade, and not completely covered with earth, sand, gravel, asphalt, or other material. A partially buried tank is considered an aboveground storage container for purposes of this part.
Permanently closed means any container or facility for which:
(1) All liquid and sludge has been removed from each container and connecting line; and
(2) All connecting lines and piping have been disconnected from the container and blanked off, all valves (except for ventilation valves) have been closed and locked, and conspicuous signs have been posted on each container stating that it is a permanently closed container and noting the date of closure.
Person includes an individual, firm, corporation, association, or partnership.
Petroleum oil means petroleum in any form, including but not limited to crude oil, fuel oil, mineral oil, sludge, oil refuse, and refined products.
Production facility means all structures (including but not limited to wells, platforms, or storage facilities), piping (including but not limited to flowlines or gathering lines), or equipment (including but not limited to workover equipment, separation equipment, or auxiliary non-transportation-related equipment) used in the production, extraction, recovery, lifting, stabilization, separation or treating of oil, or associated storage or measurement, and located in a single geographical oil or gas field operated by a single operator.
Regional Administrator means the Regional Administrator of the Environmental Protection Agency, in and for the Region in which the facility is located.
Repair means any work necessary to maintain or restore a container to a condition suitable for safe operation, other than that necessary for ordinary, day-to-day maintenance to maintain the functional integrity of the container and that does not weaken the container.
Spill Prevention, Control, and Countermeasure Plan; SPCC Plan, or Plan means the document required by §112.3 that details the equipment, workforce, procedures, and steps to prevent, control, and provide adequate countermeasures to a discharge.
Storage capacity of a container means the shell capacity of the container.

Transportation-related and non-transportation-related, as applied to an onshore or offshore facility, are defined in the Memorandum of Understanding between the Secretary of Transportation and the Administrator of the Environmental Protection Agency, dated November 24, 1971, (Appendix A of this part).
United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, the U.S. Virgin Islands, and the Pacific Island Governments.
Vegetable oil means a non-petroleum oil or fat of vegetable origin, including but not limited to oils and fats derived from plant seeds, nuts,

fruits, and kernels.

Vessel means every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water, other than a public vessel.

Wetlands means those areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include playa lakes, swamps, marshes, bogs, and similar areas such as sloughs, prairie potholes, wet meadows, prairie river overflows, mudflats, and natural ponds.

Worst case discharge for an onshore non-transportation-related facility means the largest foreseeable discharge in adverse weather conditions as determined using the worksheets in Appendix D to this part.

[67 FR 47140, July 17, 2002, as amended at 71 FR 77290, Dec. 26, 2006]

§ 112.3 Requirement to prepare and implement a Spill Prevention, Control, and Countermeasure Plan.

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The owner or operator of an onshore or offshore facility subject to this section must prepare a Spill Prevention, Control, and Countermeasure Plan (hereafter "SPCC Plan" or "Plan)," in writing, and in accordance with §112.7, and any other applicable section of this part.

(a)(1) If your onshore or offshore facility was in operation on or before August 16, 2002, you must maintain your Plan, but must amend it, if necessary to ensure compliance with this part, by October 31, 2007, and implement the Plan no later than October 31, 2007. If your onshore or offshore facility becomes operational after August 16, 2002, through October 31, 2007, and could reasonably be expected to have a discharge as described in §112.1(b), you must prepare and implement a Plan on or before October 31, 2007.

(2) If your onshore facility is a farm as defined in §112.2, the compliance date described in paragraph (a)(1) of this section is delayed until the effective date of a rule establishing SPCC requirements specifically for farms or otherwise establishes dates by which farms must comply with the provisions of this part.

(b)(1) If you are the owner or operator of an onshore or offshore facility that becomes operational after October 31, 2007, and could reasonably be expected to have a discharge as described in §112.1(b), you must prepare and implement a Plan before you begin operations.

(2) If your onshore facility meets the definition of farm in §112.2, the compliance date described in paragraph (b)(1) of this section is delayed until the effective date of a rule establishing SPCC requirements specifically for farms or otherwise establishes dates by which farms must comply with the provisions of this part.

(c) If you are the owner or operator of an onshore or offshore mobile facility, such as an onshore drilling or workover rig, barge mounted offshore drilling or workover rig, or portable fueling facility, you must prepare, implement, and maintain a facility Plan as required by this section. You must maintain your Plan, but must amend and implement it, if necessary to ensure compliance with this part, on or before October 31, 2007. If your onshore or offshore mobile facility becomes operational after October 31, 2007, and could reasonably be expected to have a discharge as described in §112.1(b), you must prepare and implement a Plan before you begin operations. This provision does not require that you prepare a new Plan each time you move the facility to a new site. The Plan may be a general Plan. When you move the mobile or portable facility, you must locate and install it using the discharge prevention practices outlined in the Plan for the facility. The Plan is applicable only while the facility is in a fixed (non-transportation) operating mode.

(d) Except as provided in §112.6, a licensed Professional Engineer must review and certify a Plan for it to be effective to satisfy the requirements of this part.

(1) By means of this certification the Professional Engineer attests:

(i) That he is familiar with the requirements of this part ;

(ii) That he or his agent has visited and examined the facility;

(iii) That the Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards, and with the requirements of this part;

(iv) That procedures for required inspections and testing have been established; and

(v) That the Plan is adequate for the facility.

(2) Such certification shall in no way relieve the owner or operator of a facility of his duty to prepare and fully implement such Plan in accordance with the requirements of this part.

(e) If you are the owner or operator of a facility for which a Plan is required under this section, you must:

(1) Maintain a complete copy of the Plan at the facility if the facility is normally attended at least four hours per day, or at the nearest field office if the facility is not so attended, and

(2) Have the Plan available to the Regional Administrator for on-site review during normal working hours.

(f) Extension of time. (1) The Regional Administrator may authorize an extension of time for the preparation and full implementation of a Plan, or any amendment thereto, beyond the time permitted for the preparation, implementation, or amendment of a Plan under this part, when he finds that the owner or operator of a facility subject to this section, cannot fully comply with the requirements as a result of either nonavailability of qualified personnel, or delays in construction or equipment delivery beyond the control and without the fault of such owner or operator or his agents or employees.

(2) If you are an owner or operator seeking an extension of time under paragraph (f)(1) of this section, you may submit a written extension request to the Regional Administrator. Your request must include:

(i) A full explanation of the cause for any such delay and the specific aspects of the Plan affected by the delay;

(ii) A full discussion of actions being taken or contemplated to minimize or mitigate such delay; and

(iii) A proposed time schedule for the implementation of any corrective actions being taken or contemplated, including interim dates for completion of tests or studies, installation and operation of any necessary equipment, or other preventive measures. In addition you may present additional oral or written statements in support of your extension

request.
(3) The submission of a written extension request under paragraph (f)(2) of this section does not relieve you of your obligation to comply with the requirements of this part. The Regional Administrator may request a copy of your Plan to evaluate the extension request. When the Regional Administrator authorizes an extension of time for particular equipment or other specific aspects of the Plan, such extension does not affect your obligation to comply with the requirements related to other equipment or other specific aspects of the Plan for which the Regional Administrator has not expressly authorized an extension.
(g) Qualified Facilities. The owner or operator of a qualified facility as defined in this subparagraph may self-certify his or her facility's Plan, as provided in §112.6. A qualified facility is one that:
(1) Has an aggregate aboveground storage capacity of 10,000 gallons or less; and
(2) Has had no single discharge as described in §112.1(b) exceeding 1,000 U.S. gallons or no two discharges as described in §112.1(b) each exceeding 42 U.S. gallons within any twelve month period in the three years prior to the SPCC Plan self-certification date, or since becoming subject to this part if the facility has been in operation for less than three years (other than discharges as described in §112.1(b) that are the result of natural disasters, acts of war, or terrorism).
[67 FR 47140, July 17, 2002, as amended at 68 FR 1351, Jan. 9, 2003; 68 FR 18894, Apr. 17, 2003; 69 FR 48798, Aug. 11, 2004; 71 FR 8466, Feb. 17, 2006; 71 FR 77290, Dec. 26, 2006]

§ 112.4 Amendment of Spill Prevention, Control, and Countermeasure Plan by Regional Administrator.

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If you are the owner or operator of a facility subject to this part, you must:
(a) Notwithstanding compliance with §112.3, whenever your facility has discharged more than 1,000 U.S. gallons of oil in a single discharge as described in §112.1(b), or discharged more than 42 U.S. gallons of oil in each of two discharges as described in §112.1(b), occurring within any twelve month period, submit the following information to the Regional Administrator within 60 days from the time the facility becomes subject to this section:
(1) Name of the facility;
(2) Your name;
(3) Location of the facility;
(4) Maximum storage or handling capacity of the facility and normal daily throughput;
(5) Corrective action and countermeasures you have taken, including a description of equipment repairs and replacements;
(6) An adequate description of the facility, including maps, flow diagrams, and topographical maps, as necessary;
(7) The cause of such discharge as described in §112.1(b), including a failure analysis of the system or subsystem in which the failure occurred;

(8) Additional preventive measures you have taken or contemplated to minimize the possibility of recurrence; and

(9) Such other information as the Regional Administrator may reasonably require pertinent to the Plan or discharge.
(b) Take no action under this section until it applies to your facility. This section does not apply until the expiration of the time permitted for the initial preparation and implementation of the Plan under §112.3, but not including any amendments to the Plan.
(c) Send to the appropriate agency or agencies in charge of oil pollution control activities in the State in which the facility is located a complete copy of all information you provided to the Regional Administrator under paragraph (a) of this section. Upon receipt of the information such State agency or agencies may conduct a review and make recommendations to the Regional Administrator as to further procedures, methods, equipment, and other requirements necessary to prevent and to contain discharges from your facility.
(d) Amend your Plan, if after review by the Regional Administrator of the information you submit under paragraph (a) of this section, or submission of information to EPA by the State agency under paragraph (c) of this section, or after on-site review of your Plan, the Regional Administrator requires that you do so. The Regional Administrator may require you to amend your Plan if he finds that it does not meet the requirements of this part or that amendment is necessary to prevent and contain discharges from your facility.
(e) Act in accordance with this paragraph when the Regional Administrator proposes by certified mail or by personal delivery that you amend your SPCC Plan. If the owner or operator is a corporation, he must also notify by mail the registered agent of such corporation, if any and if known, in the State in which the facility is located. The Regional Administrator must specify the terms of such proposed amendment. Within 30 days from receipt of such notice, you may submit written information, views, and arguments on the proposed amendment. After considering all relevant material presented, the Regional Administrator must either notify you of any amendment required or rescind the notice. You must amend your Plan as required within 30 days after such notice, unless the Regional Administrator, for good cause, specifies another effective date. You must implement the amended Plan as soon as possible, but not later than six months after you amend your Plan, unless the Regional Administrator specifies another date.
(f) If you appeal a decision made by the Regional Administrator requiring an amendment to an SPCC Plan, send the appeal to the EPA Administrator in writing within 30 days of receipt of the notice from the Regional Administrator requiring the amendment under paragraph (e) of this section. You must send a complete copy of the appeal to the Regional Administrator at the time you make the appeal. The appeal must contain a clear and concise statement of the issues and points of fact in the case. It may also contain additional information from you, or from any other person. The EPA Administrator may request additional information from you, or from any other person. The EPA Administrator must render a decision within 60 days of receiving the appeal and must notify you of his decision.

§ 112.5 Amendment of Spill Prevention, Control, and Countermeasure Plan by owners or operators.

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If you are the owner or operator of a facility subject to this part, you must:

(a) Amend the SPCC Plan for your facility in accordance with the general requirements in §112.7, and with any specific section of this part applicable to your facility, when there is a change in the facility design, construction, operation, or maintenance that materially affects its potential for a discharge as described in §112.1(b). Examples of changes that may require amendment of the Plan include, but are not limited to: commissioning or decommissioning containers; replacement, reconstruction, or movement of containers; reconstruction, replacement, or installation of piping systems; construction or demolition that might alter secondary containment structures; changes of product or service; or revision of standard operation or maintenance procedures at a facility. An amendment made under this section must be prepared within six months, and implemented as soon as possible, but not later than six months following preparation of the amendment.

(b) Notwithstanding compliance with paragraph (a) of this section, complete a review and evaluation of the SPCC Plan at least once every five years from the date your facility becomes subject to this part; or, if your facility was in operation on or before August 16, 2002, five years from the date your last review was required under this part. As a result of this review and evaluation, you must amend your SPCC Plan within six months of the review to include more effective prevention and control technology if the technology has been field-proven at the time of the review and will significantly reduce the likelihood of a discharge as described in §112.1(b) from the facility. You must implement any amendment as soon as possible, but not later than six months following preparation of any amendment. You must document your completion of the review and evaluation, and must sign a statement as to whether you will amend the Plan, either at the beginning or end of the Plan or in a log or an appendix to the Plan. The following words will suffice, "I have completed review and evaluation of the SPCC Plan for (name of facility) on (date), and will (will not) amend the Plan as a result."

(c) Except as provided in §112.6, have a Professional Engineer certify any technical amendments to your Plan in accordance with §112.3(d).

[67 FR 47140, July 17, 2002, as amended at 71 FR 77291, Dec. 26, 2006]

§ 112.6 Qualified Facility Plan Requirements.

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(a) Preparation and Self-certification of Plan. If you are the owner or operator of a facility that meets the qualified facility qualification criteria in §112.3(g), you may choose to self-certify your Plan. You must certify in the Plan that:

(1) You are familiar with the requirements of this part;

(2) You have visited and examined the facility;

(3) The Plan has been prepared in accordance with accepted and sound industry practices and standards, and with the requirements of this part;

(4) Procedures for required inspections and testing have been established;

(5) The Plan is being fully implemented;

(6) The facility meets the qualification criteria set forth under §112.3(g);

(7) The Plan does not deviate from any requirement of this part as allowed

by §§112.7(a)(2) and 112.7(d), except as provided in paragraph (c) of this section; and
(8) The Plan and individual(s) responsible for implementing the Plan have the full approval of management and the facility owner or operator has committed the necessary resources to fully implement the Plan.
(b) Self-certification of Technical Amendments. If you self-certify your Plan pursuant to paragraph (a) of this section, you must certify any technical amendments to your Plan in accordance with paragraph (a) of this section when there is a change in the facility design, construction, operation, or maintenance that affects its potential for a discharge as described in §112.1(b) except:
(1) If a Professional Engineer certified a portion of your Plan in accordance with paragraph (d) of this section, and the technical amendment affects this portion of the Plan, you must have the amended provisions of your Plan certified by a Professional Engineer in accordance with §112.6(d)(2).
(2) If the change is such that the facility no longer meets the qualifying criteria in §112.3(g) because it exceeds 10,000 gallons in aggregate aboveground storage capacity, you must prepare a Plan in accordance with the general Plan requirements in §112.7 and the applicable requirements in subparts B and C, including having the Plan certified by a Professional Engineer as required under §112.3(d).
(c) Applicable Requirements. Except as provided in this subparagraph, your self-certified SPCC Plan must comply with §112.7 and the applicable requirements in subparts B and C of this part:
(1) Environmental Equivalence. Your Plan may not include alternate methods which provide environmental equivalence pursuant to §112.7(a)(2), unless each alternate method has been reviewed and certified in writing by a Professional Engineer, as provided in paragraph (d) of this section.
(2) Impracticability. Your Plan may not include any determinations that secondary containment is impracticable and provisions in lieu of secondary containment pursuant to §112.7(d), unless each such determination and alternative provision has been reviewed and certified in writing by a Professional Engineer, as provided in paragraph (d) of this section.
(3) Security (excluding oil production facilities). You must either:
(i) Comply with the requirements under §112.7(g); or
(ii) Describe in your Plan how you secure and control access to the oil handling, processing and storage areas; secure master flow and drain valves; prevent unauthorized access to starter controls on oil pumps; secure out-of-service and loading/unloading connections of oil pipelines; address the appropriateness of security lighting to both prevent acts of vandalism and assist in the discovery of oil discharges.
(4) Bulk Storage Container Inspections. You must either:
(i) Comply with the requirements under §112.8(c)(6) or §112.12(c)(6), as applicable; or
(ii) Test/inspect each aboveground container for integrity on a regular schedule and whenever material repairs are made. You must determine, in accordance with industry standards, the appropriate qualifications for personnel performing tests and inspections, the frequency and type of testing and inspections which take into account container size, configuration, and design (such as containers that are: shop built,

skid-mounted, elevated, equipped with a liner, double walled, or partially buried). Examples of these integrity tests include, but are not limited to: visual inspection, hydrostatic testing, radiographic testing, ultrasonic testing, acoustic emissions testing, or other systems of non-destructive testing. You must keep comparison records and you must also inspect the container's supports and foundations. In addition, you must frequently inspect the outside of the container for signs of deterioration, discharges, or accumulation of oil inside diked areas. Records of inspections and tests kept under usual and customary business practices satisfy the recordkeeping requirements of this paragraph.
(d) Professional Engineer Certification of Portions of a Qualified Facility's Self-certified Plan. As described in paragraph (c) of this section, the facility owner or operator may not self-certify alternative measures allowed under §112.7(a)(2) or (d), that are included in the facility's Plan. Such measures must be reviewed and certified, in writing, by a licensed Professional Engineer as follows:
(1) For each alternative measure allowed under §112.7(a)(2), the Plan must be accompanied by a written statement by a Professional Engineer that states the reason for nonconformance and describes the alternative method and how it provides equivalent environmental protection in accordance with §112.7(a)(2). For each determination of impracticability of secondary containment pursuant to §112.7(d), the Plan must clearly explain why secondary containment measures are not practicable at this facility and provide the alternative measures required in §112.7(d) in lieu of secondary containment.
(2) By certifying each measure allowed under §112.7(a)(2) and (d), the Professional Engineer attests:
(i) That he is familiar with the requirements of this part;
(ii) That he or his agent has visited and examined the facility; and
(iii) That the alternative method of environmental equivalence in accordance with §112.7(a)(2) or the determination of impracticability and alternative measures in accordance with §112.7(d) is consistent with good engineering practice, including consideration of applicable industry standards, and with the requirements of this part.
(3) The review and certification by the Professional Engineer under this paragraph is limited to the alternative method which achieves equivalent environmental protection pursuant to §112.7(a)(2) or to the impracticability determination and measures in lieu of secondary containment pursuant to §112.7(d).
[71 FR 77291, Dec. 26, 2006]
§ 112.7   General requirements for Spill Prevention, Control, and Countermeasure Plans.
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If you are the owner or operator of a facility subject to this part you must prepare a Plan in accordance with good engineering practices. The Plan must have the full approval of management at a level of authority to commit the necessary resources to fully implement the Plan. You must prepare the Plan in writing. If you do not follow the sequence specified in this section for the Plan, you must prepare an equivalent Plan acceptable to the Regional Administrator that meets all of the applicable requirements listed in this part, and you must supplement it with a

section cross-referencing the location of requirements listed in this part and the equivalent requirements in the other prevention plan. If the Plan calls for additional facilities or procedures, methods, or equipment not yet fully operational, you must discuss these items in separate paragraphs, and must explain separately the details of installation and operational start-up. As detailed elsewhere in this section, you must also:

(a)(1) Include a discussion of your facility's conformance with the requirements listed in this part.

(2) Comply with all applicable requirements listed in this part. Except as provided in §112.6, your Plan may deviate from the requirements in paragraphs (g), (h)(2) and (3), and (i) of this section and the requirements in subparts B and C of this part, except the secondary containment requirements in paragraphs (c) and (h)(1) of this section, and §§112.8(c)(2), 112.8(c)(11), 112.9(c)(2), 112.10(c), 112.12(c)(2), and 112.12(c)(11), where applicable to a specific facility, if you provide equivalent environmental protection by some other means of spill prevention, control, or countermeasure. Where your Plan does not conform to the applicable requirements in paragraphs (g), (h)(2) and (3), and (i) of this section, or the requirements of subparts B and C of this part, except the secondary containment requirements in paragraph (c) and (h)(1) of this section, and §§112.8(c)(2), 112.8(c)(11), 112.9(c)(2), 112.10(c), 112.12(c)(2), and 112.12(c)(11), you must state the reasons for nonconformance in your Plan and describe in detail alternate methods and how you will achieve equivalent environmental protection. If the Regional Administrator determines that the measures described in your Plan do not provide equivalent environmental protection, he may require that you amend your Plan, following the procedures in §112.4(d) and (e).

(3) Describe in your Plan the physical layout of the facility and include a facility diagram, which must mark the location and contents of each container. The facility diagram must include completely buried tanks that are otherwise exempted from the requirements of this part under §112.1(d)(4). The facility diagram must also include all transfer stations and connecting pipes. You must also address in your Plan:

(i) The type of oil in each container and its storage capacity;

(ii) Discharge prevention measures including procedures for routine handling of products (loading, unloading, and facility transfers, etc.);

(iii) Discharge or drainage controls such as secondary containment around containers and other structures, equipment, and procedures for the control of a discharge;

(iv) Countermeasures for discharge discovery, response, and cleanup (both the facility's capability and those that might be required of a contractor);

(v) Methods of disposal of recovered materials in accordance with applicable legal requirements; and

(vi) Contact list and phone numbers for the facility response coordinator, National Response Center, cleanup contractors with whom you have an agreement for response, and all appropriate Federal, State, and local agencies who must be contacted in case of a discharge as described in §112.1(b).

(4) Unless you have submitted a response plan under §112.20, provide

information and procedures in your Plan to enable a person reporting a discharge as described in §112.1(b) to relate information on the exact address or location and phone number of the facility; the date and time of the discharge, the type of material discharged; estimates of the total quantity discharged; estimates of the quantity discharged as described in §112.1(b); the source of the discharge; a description of all affected media; the cause of the discharge; any damages or injuries caused by the discharge; actions being used to stop, remove, and mitigate the effects of the discharge; whether an evacuation may be needed; and, the names of individuals and/or organizations who have also been contacted.
(5) Unless you have submitted a response plan under §112.20, organize portions of the Plan describing procedures you will use when a discharge occurs in a way that will make them readily usable in an emergency, and include appropriate supporting material as appendices.
(b) Where experience indicates a reasonable potential for equipment failure (such as loading or unloading equipment, tank overflow, rupture, or leakage, or any other equipment known to be a source of a discharge), include in your Plan a prediction of the direction, rate of flow, and total quantity of oil which could be discharged from the facility as a result of each type of major equipment failure.
(c) Provide appropriate containment and/or diversionary structures or equipment to prevent a discharge as described in §112.1(b), except as provided in paragraph (k) of this section for qualified oil-filled operational equipment. The entire containment system, including walls and floor, must be capable of containing oil and must be constructed so that any discharge from a primary containment system, such as a tank or pipe, will not escape the containment system before cleanup occurs. At a minimum, you must use one of the following prevention systems or its equivalent:
(1) For onshore facilities:
(i) Dikes, berms, or retaining walls sufficiently impervious to contain oil;
(ii) Curbing;
(iii) Culverting, gutters, or other drainage systems;
(iv) Weirs, booms, or other barriers;
(v) Spill diversion ponds;
(vi) Retention ponds; or
(vii) Sorbent materials.
(2) For offshore facilities:
(i) Curbing or drip pans; or
(ii) Sumps and collection systems.
(d) Provided your Plan is certified by a licensed Professional Engineer under §112.3(d), or, in the case of a qualified facility that meets the criteria in §112.3(g), the relevant sections of your Plan are certified by a licensed Professional Engineer under §112.6(d), if you determine that the installation of any of the structures or pieces of equipment listed in paragraphs (c) and (h)(1) of this section, and §§112.8(c)(2), 112.8(c)(11), 112.9(c)(2), 112.10(c), 112.12(c)(2), and 112.12(c)(11) to prevent a discharge as described in §112.1(b) from any onshore or offshore facility is not practicable, you must clearly explain in your Plan why such measures are not practicable; for bulk storage containers, conduct

both periodic integrity testing of the containers and periodic integrity and leak testing of the valves and piping; and, unless you have submitted a response plan under §112.20, provide in your Plan the following:
(1) An oil spill contingency plan following the provisions of part 109 of this chapter.
(2) A written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful.
(e) Inspections, tests, and records. Conduct inspections and tests required by this part in accordance with written procedures that you or the certifying engineer develop for the facility. You must keep these written procedures and a record of the inspections and tests, signed by the appropriate supervisor or inspector, with the SPCC Plan for a period of three years. Records of inspections and tests kept under usual and customary business practices will suffice for purposes of this paragraph.
(f) Personnel, training, and discharge prevention procedures. (1) At a minimum, train your oil-handling personnel in the operation and maintenance of equipment to prevent discharges; discharge procedure protocols; applicable pollution control laws, rules, and regulations; general facility operations; and, the contents of the facility SPCC Plan.
(2) Designate a person at each applicable facility who is accountable for discharge prevention and who reports to facility management.
(3) Schedule and conduct discharge prevention briefings for your oil-handling personnel at least once a year to assure adequate understanding of the SPCC Plan for that facility. Such briefings must highlight and describe known discharges as described in §112.1(b) or failures, malfunctioning components, and any recently developed precautionary measures.
(g) Security (excluding oil production facilities). (1) Fully fence each facility handling, processing, or storing oil, and lock and/or guard entrance gates when the facility is not in production or is unattended.
(2) Ensure that the master flow and drain valves and any other valves permitting direct outward flow of the container's contents to the surface have adequate security measures so that they remain in the closed position when in non-operating or non-standby status.
(3) Lock the starter control on each oil pump in the “off” position and locate it at a site accessible only to authorized personnel when the pump is in a non-operating or non-standby status.
(4) Securely cap or blank-flange the loading/unloading connections of oil pipelines or facility piping when not in service or when in standby service for an extended time. This security practice also applies to piping that is emptied of liquid content either by draining or by inert gas pressure.
(5) Provide facility lighting commensurate with the type and location of the facility that will assist in the:
(i) Discovery of discharges occurring during hours of darkness, both by operating personnel, if present, and by non-operating personnel (the general public, local police, etc.); and
(ii) Prevention of discharges occurring through acts of vandalism.
(h) Facility tank car and tank truck loading/unloading rack (excluding offshore facilities). (1) Where loading/unloading area drainage does not

flow into a catchment basin or treatment facility designed to handle discharges, use a quick drainage system for tank car or tank truck loading and unloading areas. You must design any containment system to hold at least the maximum capacity of any single compartment of a tank car or tank truck loaded or unloaded at the facility.
(2) Provide an interlocked warning light or physical barrier system, warning signs, wheel chocks, or vehicle break interlock system in loading/unloading areas to prevent vehicles from departing before complete disconnection of flexible or fixed oil transfer lines.
(3) Prior to filling and departure of any tank car or tank truck, closely inspect for discharges the lowermost drain and all outlets of such vehicles, and if necessary, ensure that they are tightened, adjusted, or replaced to prevent liquid discharge while in transit.
(i) If a field-constructed aboveground container undergoes a repair, alteration, reconstruction, or a change in service that might affect the risk of a discharge or failure due to brittle fracture or other catastrophe, or has discharged oil or failed due to brittle fracture failure or other catastrophe, evaluate the container for risk of discharge or failure due to brittle fracture or other catastrophe, and as necessary, take appropriate action.
(j) In addition to the minimal prevention standards listed under this section, include in your Plan a complete discussion of conformance with the applicable requirements and other effective discharge prevention and containment procedures listed in this part or any applicable more stringent State rules, regulations, and guidelines.
(k) Qualified Oil-filled Operational Equipment. The owner or operator of a facility with oil-filled operational equipment that meets the qualification criteria in paragraph (k)(1) of this sub-section may choose to implement for this qualified oil-filled operational equipment the alternate requirements as described in paragraph (k)(2) of this sub-section in lieu of general secondary containment required in paragraph (c) of this section.
(1) Qualification Criteria—Reportable Discharge History: The owner or operator of a facility that has had no single discharge as described in §112.1(b) from any oil-filled operational equipment exceeding 1,000 U.S. gallons or no two discharges as described in §112.1(b) from any oil-filled operational equipment each exceeding 42 U.S. gallons within any twelve month period in the three years prior to the SPCC Plan certification date, or since becoming subject to this part if the facility has been in operation for less than three years (other than oil discharges as described in §112.1(b) that are the result of natural disasters, acts of war or terrorism); and
(2) Alternative Requirements to General Secondary Containment. If secondary containment is not provided for qualified oil-filled operational equipment pursuant to paragraph (c) of this section, the owner or operator of a facility with qualified oil-filled operational equipment must:
(i) Establish and document the facility procedures for inspections or a monitoring program to detect equipment failure and/or a discharge; and
(ii) Unless you have submitted a response plan under §112.20, provide in your Plan the following:
(A) An oil spill contingency plan following the provisions of part 109 of

this chapter.
(B) A written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful.
[67 FR 47140, July 17, 2002, as amended at 71 FR 77292, Dec. 26, 2006]

Subpart B—Requirements for Petroleum Oils and Non-Petroleum Oils, Except Animal Fats and Oils and Greases, and Fish and Marine Mammal Oils; and Vegetable Oils (Including Oils from Seeds, Nuts, Fruits, and Kernels)

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Source: 67 FR 47146, July 17, 2002, unless otherwise noted.

§ 112.8 Spill Prevention, Control, and Countermeasure Plan requirements for onshore facilities (excluding production facilities).

top

If you are the owner or operator of an onshore facility (excluding a production facility), you must:
(a) Meet the general requirements for the Plan listed under §112.7, and the specific discharge prevention and containment procedures listed in this section.
(b) Facility drainage. (1) Restrain drainage from diked storage areas by valves to prevent a discharge into the drainage system or facility effluent treatment system, except where facility systems are designed to control such discharge. You may empty diked areas by pumps or ejectors; however, you must manually activate these pumps or ejectors and must inspect the condition of the accumulation before starting, to ensure no oil will be discharged.
(2) Use valves of manual, open-and-closed design, for the drainage of diked areas. You may not use flapper-type drain valves to drain diked areas. If your facility drainage drains directly into a watercourse and not into an on-site wastewater treatment plant, you must inspect and may drain uncontaminated retained stormwater, as provided in paragraphs (c)(3)(ii), (iii), and (iv) of this section.
(3) Design facility drainage systems from undiked areas with a potential for a discharge (such as where piping is located outside containment walls or where tank truck discharges may occur outside the loading area) to flow into ponds, lagoons, or catchment basins designed to retain oil or return it to the facility. You must not locate catchment basins in areas subject to periodic flooding.
(4) If facility drainage is not engineered as in paragraph (b)(3) of this section, equip the final discharge of all ditches inside the facility with a diversion system that would, in the event of an uncontrolled discharge, retain oil in the facility.
(5) Where drainage waters are treated in more than one treatment unit and such treatment is continuous, and pump transfer is needed, provide two "lift" pumps and permanently install at least one of the pumps. Whatever techniques you use, you must engineer facility drainage systems to prevent a discharge as described in §112.1(b) in case there is an equipment failure or human error at the facility.
(c) Bulk storage containers. (1) Not use a container for the storage of oil unless its material and construction are compatible with the material stored and conditions of storage such as pressure and temperature.
(2) Construct all bulk storage tank installations (except mobile

refuelers) so that you provide a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation. You must ensure that diked areas are sufficiently impervious to contain discharged oil. Dikes, containment curbs, and pits are commonly employed for this purpose. You may also use an alternative system consisting of a drainage trench enclosure that must be arranged so that any discharge will terminate and be safely confined in a facility catchment basin or holding pond.

(3) Not allow drainage of uncontaminated rainwater from the diked area into a storm drain or discharge of an effluent into an open watercourse, lake, or pond, bypassing the facility treatment system unless you:

(i) Normally keep the bypass valve sealed closed.

(ii) Inspect the retained rainwater to ensure that its presence will not cause a discharge as described in §112.1(b).

(iii) Open the bypass valve and reseal it following drainage under responsible supervision; and

(iv) Keep adequate records of such events, for example, any records required under permits issued in accordance with §§122.41(j)(2) and 122.41(m)(3) of this chapter.

(4) Protect any completely buried metallic storage tank installed on or after January 10, 1974 from corrosion by coatings or cathodic protection compatible with local soil conditions. You must regularly leak test such completely buried metallic storage tanks.

(5) Not use partially buried or bunkered metallic tanks for the storage of oil, unless you protect the buried section of the tank from corrosion. You must protect partially buried and bunkered tanks from corrosion by coatings or cathodic protection compatible with local soil conditions.

(6) Test each aboveground container for integrity on a regular schedule, and whenever you make material repairs. The frequency of and type of testing must take into account container size and design (such as floating roof, skid-mounted, elevated, or partially buried). You must combine visual inspection with another testing technique such as hydrostatic testing, radiographic testing, ultrasonic testing, acoustic emissions testing, or another system of non-destructive shell testing. You must keep comparison records and you must also inspect the container's supports and foundations. In addition, you must frequently inspect the outside of the container for signs of deterioration, discharges, or accumulation of oil inside diked areas. Records of inspections and tests kept under usual and customary business practices will suffice for purposes of this paragraph.

(7) Control leakage through defective internal heating coils by monitoring the steam return and exhaust lines for contamination from internal heating coils that discharge into an open watercourse, or pass the steam return or exhaust lines through a settling tank, skimmer, or other separation or retention system.

(8) Engineer or update each container installation in accordance with good engineering practice to avoid discharges. You must provide at least one of the following devices:

(i) High liquid level alarms with an audible or visual signal at a constantly attended operation or surveillance station. In smaller facilities an audible air vent may suffice.

(ii) High liquid level pump cutoff devices set to stop flow at a

predetermined container content level.
(iii) Direct audible or code signal communication between the container gauger and the pumping station.
(iv) A fast response system for determining the liquid level of each bulk storage container such as digital computers, telepulse, or direct vision gauges. If you use this alternative, a person must be present to monitor gauges and the overall filling of bulk storage containers.
(v) You must regularly test liquid level sensing devices to ensure proper operation.
(9) Observe effluent treatment facilities frequently enough to detect possible system upsets that could cause a discharge as described in §112.1(b).
(10) Promptly correct visible discharges which result in a loss of oil from the container, including but not limited to seams, gaskets, piping, pumps, valves, rivets, and bolts. You must promptly remove any accumulations of oil in diked areas.
(11) Position or locate mobile or portable oil storage containers to prevent a discharge as described in §112.1(b). Except for mobile refuelers, you must furnish a secondary means of containment, such as a dike or catchment basin, sufficient to contain the capacity of the largest single compartment or container with sufficient freeboard to contain precipitation.
(d) Facility transfer operations, pumping, and facility process. (1) Provide buried piping that is installed or replaced on or after August 16, 2002, with a protective wrapping and coating. You must also cathodically protect such buried piping installations or otherwise satisfy the corrosion protection standards for piping in part 280 of this chapter or a State program approved under part 281 of this chapter. If a section of buried line is exposed for any reason, you must carefully inspect it for deterioration. If you find corrosion damage, you must undertake additional examination and corrective action as indicated by the magnitude of the damage.
(2) Cap or blank-flange the terminal connection at the transfer point and mark it as to origin when piping is not in service or is in standby service for an extended time.
(3) Properly design pipe supports to minimize abrasion and corrosion and allow for expansion and contraction.
(4) Regularly inspect all aboveground valves, piping, and appurtenances. During the inspection you must assess the general condition of items, such as flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces. You must also conduct integrity and leak testing of buried piping at the time of installation, modification, construction, relocation, or replacement.
(5) Warn all vehicles entering the facility to be sure that no vehicle will endanger aboveground piping or other oil transfer operations.
[67 FR 47146, July 17, 2002, as amended at 71 FR 77293, Dec. 26, 2006]
§ 112.9 Spill Prevention, Control, and Countermeasure Plan requirements for onshore oil production facilities.
top
If you are the owner or operator of an onshore production facility, you must:

(a) Meet the general requirements for the Plan listed under §112.7, and the specific discharge prevention and containment procedures listed under this section.

(b) Oil production facility drainage. (1) At tank batteries and separation and treating areas where there is a reasonable possibility of a discharge as described in §112.1(b), close and seal at all times drains of dikes or drains of equivalent measures required under §112.7(c)(1), except when draining uncontaminated rainwater. Prior to drainage, you must inspect the diked area and take action as provided in §112.8(c)(3)(ii), (iii), and (iv). You must remove accumulated oil on the rainwater and return it to storage or dispose of it in accordance with legally approved methods.

(2) Inspect at regularly scheduled intervals field drainage systems (such as drainage ditches or road ditches), and oil traps, sumps, or skimmers, for an accumulation of oil that may have resulted from any small discharge. You must promptly remove any accumulations of oil.

(c) Oil production facility bulk storage containers. (1) Not use a container for the storage of oil unless its material and construction are compatible with the material stored and the conditions of storage.

(2) Provide all tank battery, separation, and treating facility installations with a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation. You must safely confine drainage from undiked areas in a catchment basin or holding pond.

(3) Periodically and upon a regular schedule visually inspect each container of oil for deterioration and maintenance needs, including the foundation and support of each container that is on or above the surface of the ground.

(4) Engineer or update new and old tank battery installations in accordance with good engineering practice to prevent discharges. You must provide at least one of the following:

(i) Container capacity adequate to assure that a container will not overfill if a pumper/gauger is delayed in making regularly scheduled rounds.

(ii) Overflow equalizing lines between containers so that a full container can overflow to an adjacent container.

(iii) Vacuum protection adequate to prevent container collapse during a pipeline run or other transfer of oil from the container.

(iv) High level sensors to generate and transmit an alarm signal to the computer where the facility is subject to a computer production control system.

(d) Facility transfer operations, oil production facility. (1) Periodically and upon a regular schedule inspect all aboveground valves and piping associated with transfer operations for the general condition of flange joints, valve glands and bodies, drip pans, pipe supports, pumping well polish rod stuffing boxes, bleeder and gauge valves, and other such items.

(2) Inspect saltwater (oil field brine) disposal facilities often, particularly following a sudden change in atmospheric temperature, to detect possible system upsets capable of causing a discharge.

(3) Have a program of flowline maintenance to prevent discharges from each flowline.

§ 112.10 Spill Prevention, Control, and Countermeasure Plan requirements for onshore oil drilling and workover facilities.

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If you are the owner or operator of an onshore oil drilling and workover facility, you must:

(a) Meet the general requirements listed under §112.7, and also meet the specific discharge prevention and containment procedures listed under this section.

(b) Position or locate mobile drilling or workover equipment so as to prevent a discharge as described in §112.1(b).

(c) Provide catchment basins or diversion structures to intercept and contain discharges of fuel, crude oil, or oily drilling fluids.

(d) Install a blowout prevention (BOP) assembly and well control system before drilling below any casing string or during workover operations. The BOP assembly and well control system must be capable of controlling any well-head pressure that may be encountered while that BOP assembly and well control system are on the well.

§ 112.11 Spill Prevention, Control, and Countermeasure Plan requirements for offshore oil drilling, production, or workover facilities.

top

If you are the owner or operator of an offshore oil drilling, production, or workover facility, you must:

(a) Meet the general requirements listed under §112.7, and also meet the specific discharge prevention and containment procedures listed under this section.

(b) Use oil drainage collection equipment to prevent and control small oil discharges around pumps, glands, valves, flanges, expansion joints, hoses, drain lines, separators, treaters, tanks, and associated equipment. You must control and direct facility drains toward a central collection sump to prevent the facility from having a discharge as described in §112.1(b). Where drains and sumps are not practicable, you must remove oil contained in collection equipment as often as necessary to prevent overflow.

(c) For facilities employing a sump system, provide adequately sized sump and drains and make available a spare pump to remove liquid from the sump and assure that oil does not escape. You must employ a regularly scheduled preventive maintenance inspection and testing program to assure reliable operation of the liquid removal system and pump start-up device. Redundant automatic sump pumps and control devices may be required on some installations.

(d) At facilities with areas where separators and treaters are equipped with dump valves which predominantly fail in the closed position and where pollution risk is high, specially equip the facility to prevent the discharge of oil. You must prevent the discharge of oil by:

(1) Extending the flare line to a diked area if the separator is near shore;

(2) Equipping the separator with a high liquid level sensor that will automatically shut in wells producing to the separator; or

(3) Installing parallel redundant dump valves.

(e) Equip atmospheric storage or surge containers with high liquid level sensing devices that activate an alarm or control the flow, or otherwise prevent discharges.

(f) Equip pressure containers with high and low pressure sensing devices that activate an alarm or control the flow.

(g) Equip containers with suitable corrosion protection.

(h) Prepare and maintain at the facility a written procedure within the Plan for inspecting and testing pollution prevention equipment and systems.

(i) Conduct testing and inspection of the pollution prevention equipment and systems at the facility on a scheduled periodic basis, commensurate with the complexity, conditions, and circumstances of the facility and any other appropriate regulations. You must use simulated discharges for testing and inspecting human and equipment pollution control and countermeasure systems.

(j) Describe in detailed records surface and subsurface well shut-in valves and devices in use at the facility for each well sufficiently to determine their method of activation or control, such as pressure differential, change in fluid or flow conditions, combination of pressure and flow, manual or remote control mechanisms.

(k) Install a BOP assembly and well control system during workover operations and before drilling below any casing string. The BOP assembly and well control system must be capable of controlling any well-head pressure that may be encountered while the BOP assembly and well control system are on the well.

(l) Equip all manifolds (headers) with check valves on individual flowlines.

(m) Equip the flowline with a high pressure sensing device and shut-in valve at the wellhead if the shut-in well pressure is greater than the working pressure of the flowline and manifold valves up to and including the header valves. Alternatively you may provide a pressure relief system for flowlines.

(n) Protect all piping appurtenant to the facility from corrosion, such as with protective coatings or cathodic protection.

(o) Adequately protect sub-marine piping appurtenant to the facility against environmental stresses and other activities such as fishing operations.

(p) Maintain sub-marine piping appurtenant to the facility in good operating condition at all times. You must periodically and according to a schedule inspect or test such piping for failures. You must document and keep a record of such inspections or tests at the facility.

Subpart C—Requirements for Animal Fats and Oils and Greases, and Fish and Marine Mammal Oils; and for Vegetable Oils, including Oils from Seeds, Nuts, Fruits, and Kernels.

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Source: 67 FR 57149, July 17, 2002, unless otherwise noted.

§ 112.12 Spill Prevention, Control, and Countermeasure Plan requirements.

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If you are the owner or operator of an onshore facility (excluding a production facility), you must:

(a) Meet the general requirements for the Plan listed under §112.7, and the specific discharge prevention and containment procedures listed in this section.

(b) Facility drainage. (1) Restrain drainage from diked storage areas by valves to prevent a discharge into the drainage system or facility effluent treatment system, except where facility systems are designed to control such discharge. You may empty diked areas by pumps or ejectors; however, you must manually activate these pumps or ejectors and must inspect the condition of the accumulation before starting, to ensure no oil will be discharged.
(2) Use valves of manual, open-and-closed design, for the drainage of diked areas. You may not use flapper-type drain valves to drain diked areas. If your facility drainage drains directly into a watercourse and not into an on-site wastewater treatment plant, you must inspect and may drain uncontaminated retained stormwater, subject to the requirements of paragraphs (c)(3)(ii), (iii), and (iv) of this section.
(3) Design facility drainage systems from undiked areas with a potential for a discharge (such as where piping is located outside containment walls or where tank truck discharges may occur outside the loading area) to flow into ponds, lagoons, or catchment basins designed to retain oil or return it to the facility. You must not locate catchment basins in areas subject to periodic flooding.
(4) If facility drainage is not engineered as in paragraph (b)(3) of this section, equip the final discharge of all ditches inside the facility with a diversion system that would, in the event of an uncontrolled discharge, retain oil in the facility.
(5) Where drainage waters are treated in more than one treatment unit and such treatment is continuous, and pump transfer is needed, provide two “lift” pumps and permanently install at least one of the pumps. Whatever techniques you use, you must engineer facility drainage systems to prevent a discharge as described in §112.1(b) in case there is an equipment failure or human error at the facility.
(c) Bulk storage containers. (1) Not use a container for the storage of oil unless its material and construction are compatible with the material stored and conditions of storage such as pressure and temperature.
(2) Construct all bulk storage tank installations (except mobile refuelers) so that you provide a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation. You must ensure that diked areas are sufficiently impervious to contain discharged oil. Dikes, containment curbs, and pits are commonly employed for this purpose. You may also use an alternative system consisting of a drainage trench enclosure that must be arranged so that any discharge will terminate and be safely confined in a facility catchment basin or holding pond.
(3) Not allow drainage of uncontaminated rainwater from the diked area into a storm drain or discharge of an effluent into an open watercourse, lake, or pond, bypassing the facility treatment system unless you:
(i) Normally keep the bypass valve sealed closed.
(ii) Inspect the retained rainwater to ensure that its presence will not cause a discharge as described in §112.1(b).
(iii) Open the bypass valve and reseal it following drainage under responsible supervision; and
(iv) Keep adequate records of such events, for example, any records required under permits issued in accordance with §§122.41(j)(2) and

122.41(m)(3) of this chapter.
(4) Protect any completely buried metallic storage tank installed on or after January 10, 1974 from corrosion by coatings or cathodic protection compatible with local soil conditions. You must regularly leak test such completely buried metallic storage tanks.
(5) Not use partially buried or bunkered metallic tanks for the storage of oil, unless you protect the buried section of the tank from corrosion. You must protect partially buried and bunkered tanks from corrosion by coatings or cathodic protection compatible with local soil conditions.
(6) Test each aboveground container for integrity on a regular schedule, and whenever you make material repairs. The frequency of and type of testing must take into account container size and design (such as floating roof, skid-mounted, elevated, or partially buried). You must combine visual inspection with another testing technique such as hydrostatic testing, radiographic testing, ultrasonic testing, acoustic emissions testing, or another system of non-destructive shell testing. You must keep comparison records and you must also inspect the container's supports and foundations. In addition, you must frequently inspect the outside of the container for signs of deterioration, discharges, or accumulation of oil inside diked areas. Records of inspections and tests kept under usual and customary business practices will suffice for purposes of this paragraph.
(7) Control leakage through defective internal heating coils by monitoring the steam return and exhaust lines for contamination from internal heating coils that discharge into an open watercourse, or pass the steam return or exhaust lines through a settling tank, skimmer, or other separation or retention system.
(8) Engineer or update each container installation in accordance with good engineering practice to avoid discharges. You must provide at least one of the following devices:
(i) High liquid level alarms with an audible or visual signal at a constantly attended operation or surveillance station. In smaller facilities an audible air vent may suffice.
(ii) High liquid level pump cutoff devices set to stop flow at a predetermined container content level.
(iii) Direct audible or code signal communication between the container gauger and the pumping station.
(iv) A fast response system for determining the liquid level of each bulk storage container such as digital computers, telepulse, or direct vision gauges. If you use this alternative, a person must be present to monitor gauges and the overall filling of bulk storage containers.
(v) You must regularly test liquid level sensing devices to ensure proper operation.
(9) Observe effluent treatment facilities frequently enough to detect possible system upsets that could cause a discharge as described in §112.1(b).
(10) Promptly correct visible discharges which result in a loss of oil from the container, including but not limited to seams, gaskets, piping, pumps, valves, rivets, and bolts. You must promptly remove any accumulations of oil in diked areas.
(11) Position or locate mobile or portable oil storage containers to prevent a discharge as described in §112.1(b). Except for mobile

refuelers, you must furnish a secondary means of containment, such as a dike or catchment basin, sufficient to contain the capacity of the largest single compartment or container with sufficient freeboard to contain precipitation.

(d) Facility transfer operations, pumping, and facility process. (1) Provide buried piping that is installed or replaced on or after August 16, 2002, with a protective wrapping and coating. You must also cathodically protect such buried piping installations or otherwise satisfy the corrosion protection standards for piping in part 280 of this chapter or a State program approved under part 281 of this chapter. If a section of buried line is exposed for any reason, you must carefully inspect it for deterioration. If you find corrosion damage, you must undertake additional examination and corrective action as indicated by the magnitude of the damage.

(2) Cap or blank-flange the terminal connection at the transfer point and mark it as to origin when piping is not in service or is in standby service for an extended time.

(3) Properly design pipe supports to minimize abrasion and corrosion and allow for expansion and contraction.

(4) Regularly inspect all aboveground valves, piping, and appurtenances. During the inspection you must assess the general condition of items, such as flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces. You must also conduct integrity and leak testing of buried piping at the time of installation, modification, construction, relocation, or replacement.

(5) Warn all vehicles entering the facility to be sure that no vehicle will endanger aboveground piping or other oil transfer operations.

[
67 FR 57149, July 17, 2002, as amended at 71 FR 77293, Dec. 26, 2006]

§§ 112.13-112.15   [Reserved]

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Subpart D—Response Requirements

top

§ 112.20   Facility response plans.

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(a) The owner or operator of any non-transportation-related onshore facility that, because of its location, could reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines shall prepare and submit a facility response plan to the Regional Administrator, according to the following provisions:

(1) For the owner or operator of a facility in operation on or before February 18, 1993 who is required to prepare and submit a response plan under 33 U.S.C. 1321(j)(5), the Oil Pollution Act of 1990 (Pub. L. 101–380, 33 U.S.C. 2701 et seq.) requires the submission of a response plan that satisfies the requirements of 33 U.S.C. 1321(j)(5) no later than February 18, 1993.

(i) The owner or operator of an existing facility that was in operation on or before February 18, 1993 who submitted a response plan by February 18, 1993 shall revise the response plan to satisfy the requirements of this section and resubmit the response plan or updated portions of the response

plan to the Regional Administrator by February 18, 1995.
(ii) The owner or operator of an existing facility in operation on or before February 18, 1993 who failed to submit a response plan by February 18, 1993 shall prepare and submit a response plan that satisfies the requirements of this section to the Regional Administrator before August 30, 1994.
(2) The owner or operator of a facility in operation on or after August 30, 1994 that satisfies the criteria in paragraph (f)(1) of this section or that is notified by the Regional Administrator pursuant to paragraph (b) of this section shall prepare and submit a facility response plan that satisfies the requirements of this section to the Regional Administrator.
(i) For a facility that commenced operations after February 18, 1993 but prior to August 30, 1994, and is required to prepare and submit a response plan based on the criteria in paragraph (f)(1) of this section, the owner or operator shall submit the response plan or updated portions of the response plan, along with a completed version of the response plan cover sheet contained in Appendix F to this part, to the Regional Administrator prior to August 30, 1994.
(ii) For a newly constructed facility that commences operation after August 30, 1994, and is required to prepare and submit a response plan based on the criteria in paragraph (f)(1) of this section, the owner or operator shall submit the response plan, along with a completed version of the response plan cover sheet contained in Appendix F to this part, to the Regional Administrator prior to the start of operations (adjustments to the response plan to reflect changes that occur at the facility during the start-up phase of operations must be submitted to the Regional Administrator after an operational trial period of 60 days).
(iii) For a facility required to prepare and submit a response plan after August 30, 1994, as a result of a planned change in design, construction, operation, or maintenance that renders the facility subject to the criteria in paragraph (f)(1) of this section, the owner or operator shall submit the response plan, along with a completed version of the response plan cover sheet contained in Appendix F to this part, to the Regional Administrator before the portion of the facility undergoing change commences operations (adjustments to the response plan to reflect changes that occur at the facility during the start-up phase of operations must be submitted to the Regional Administrator after an operational trial period of 60 days).
(iv) For a facility required to prepare and submit a response plan after August 30, 1994, as a result of an unplanned event or change in facility characteristics that renders the facility subject to the criteria in paragraph (f)(1) of this section, the owner or operator shall submit the response plan, along with a completed version of the response plan cover sheet contained in Appendix F to this part, to the Regional Administrator within six months of the unplanned event or change.
(3) In the event the owner or operator of a facility that is required to prepare and submit a response plan uses an alternative formula that is comparable to one contained in Appendix C to this part to evaluate the criterion in paragraph (f)(1)(ii)(B) or (f)(1)(ii)(C) of this section, the owner or operator shall attach documentation to the response plan cover sheet contained in Appendix F to this part that demonstrates the

reliability and analytical soundness of the alternative formula.

(4) Preparation and submission of response plans—Animal fat and vegetable oil facilities. The owner or operator of any non-transportation-related facility that handles, stores, or transports animal fats and vegetable oils must prepare and submit a facility response plan as follows:

(i) Facilities with approved plans. The owner or operator of a facility with a facility response plan that has been approved under paragraph (c) of this section by July 31, 2000 need not prepare or submit a revised plan except as otherwise required by paragraphs (b), (c), or (d) of this section.

(ii) Facilities with plans that have been submitted to the Regional Administrator. Except for facilities with approved plans as provided in paragraph (a)(4)(i) of this section, the owner or operator of a facility that has submitted a response plan to the Regional Administrator prior to July 31, 2000 must review the plan to determine if it meets or exceeds the applicable provisions of this part. An owner or operator need not prepare or submit a new plan if the existing plan meets or exceeds the applicable provisions of this part. If the plan does not meet or exceed the applicable provisions of this part, the owner or operator must prepare and submit a new plan by September 28, 2000.

(iii) Newly regulated facilities. The owner or operator of a newly constructed facility that commences operation after July 31, 2000 must prepare and submit a plan to the Regional Administrator in accordance with paragraph (a)(2)(ii) of this section. The plan must meet or exceed the applicable provisions of this part. The owner or operator of an existing facility that must prepare and submit a plan after July 31, 2000 as a result of a planned or unplanned change in facility characteristics that causes the facility to become regulated under paragraph (f)(1) of this section, must prepare and submit a plan to the Regional Administrator in accordance with paragraph (a)(2)(iii) or (iv) of this section, as appropriate. The plan must meet or exceed the applicable provisions of this part.

(iv) Facilities amending existing plans. The owner or operator of a facility submitting an amended plan in accordance with paragraph (d) of this section after July 31, 2000, including plans that had been previously approved, must also review the plan to determine if it meets or exceeds the applicable provisions of this part. If the plan does not meet or exceed the applicable provisions of this part, the owner or operator must revise and resubmit revised portions of an amended plan to the Regional Administrator in accordance with paragraph (d) of this section, as appropriate. The plan must meet or exceed the applicable provisions of this part.

(b)(1) The Regional Administrator may at any time require the owner or operator of any non-transportation-related onshore facility to prepare and submit a facility response plan under this section after considering the factors in paragraph (f)(2) of this section. If such a determination is made, the Regional Administrator shall notify the facility owner or operator in writing and shall provide a basis for the determination. If the Regional Administrator notifies the owner or operator in writing of the requirement to prepare and submit a response plan under this section, the owner or operator of the facility shall submit the response plan to

the Regional Administrator within six months of receipt of such written notification.
(2) The Regional Administrator shall review plans submitted by such facilities to determine whether the facility could, because of its location, reasonably be expected to cause significant and substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines.
(c) The Regional Administrator shall determine whether a facility could, because of its location, reasonably be expected to cause significant and substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines, based on the factors in paragraph (f)(3) of this section. If such a determination is made, the Regional Administrator shall notify the owner or operator of the facility in writing and:
(1) Promptly review the facility response plan;
(2) Require amendments to any response plan that does not meet the requirements of this section;
(3) Approve any response plan that meets the requirements of this section; and
(4) Review each response plan periodically thereafter on a schedule established by the Regional Administrator provided that the period between plan reviews does not exceed five years.
(d)(1) The owner or operator of a facility for which a response plan is required under this part shall revise and resubmit revised portions of the response plan within 60 days of each facility change that materially may affect the response to a worst case discharge, including:
(i) A change in the facility's configuration that materially alters the information included in the response plan;
(ii) A change in the type of oil handled, stored, or transferred that materially alters the required response resources;
(iii) A material change in capabilities of the oil spill removal organization(s) that provide equipment and personnel to respond to discharges of oil described in paragraph (h)(5) of this section;
(iv) A material change in the facility's spill prevention and response equipment or emergency response procedures; and
(v) Any other changes that materially affect the implementation of the response plan.
(2) Except as provided in paragraph (d)(1) of this section, amendments to personnel and telephone number lists included in the response plan and a change in the oil spill removal organization(s) that does not result in a material change in support capabilities do not require approval by the Regional Administrator. Facility owners or operators shall provide a copy of such changes to the Regional Administrator as the revisions occur.
(3) The owner or operator of a facility that submits changes to a response plan as provided in paragraph (d)(1) or (d)(2) of this section shall provide the EPA-issued facility identification number (where one has been assigned) with the changes.
(4) The Regional Administrator shall review for approval changes to a response plan submitted pursuant to paragraph (d)(1) of this section for a facility determined pursuant to paragraph (f)(3) of this section to have the potential to cause significant and substantial harm to the

environment.
(e) If the owner or operator of a facility determines pursuant to paragraph (a)(2) of this section that the facility could not, because of its location, reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines, the owner or operator shall complete and maintain at the facility the certification form contained in Appendix C to this part and, in the event an alternative formula that is comparable to one contained in Appendix C to this part is used to evaluate the criterion in paragraph (f)(1)(ii)(B) or (f)(1)(ii)(C) of this section, the owner or operator shall attach documentation to the certification form that demonstrates the reliability and analytical soundness of the comparable formula and shall notify the Regional Administrator in writing that an alternative formula was used.
(f)(1) A facility could, because of its location, reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines pursuant to paragraph (a)(2) of this section, if it meets any of the following criteria applied in accordance with the flowchart contained in Attachment C-I to Appendix C to this part:
(i) The facility transfers oil over water to or from vessels and has a total oil storage capacity greater than or equal to 42,000 gallons; or
(ii) The facility's total oil storage capacity is greater than or equal to 1 million gallons, and one of the following is true:
(A) The facility does not have secondary containment for each aboveground storage area sufficiently large to contain the capacity of the largest aboveground oil storage tank within each storage area plus sufficient freeboard to allow for precipitation;
(B) The facility is located at a distance (as calculated using the appropriate formula in Appendix C to this part or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments. For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III of the “Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments” (see Appendix E to this part, section 13, for availability) and the applicable Area Contingency Plan prepared pursuant to section 311(j)(4) of the Clean Water Act;
(C) The facility is located at a distance (as calculated using the appropriate formula in Appendix C to this part or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake; or
(D) The facility has had a reportable oil discharge in an amount greater than or equal to 10,000 gallons within the last 5 years.
(2)(i) To determine whether a facility could, because of its location, reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines pursuant to paragraph (b) of this section, the Regional Administrator shall consider the following:
(A) Type of transfer operation;
(B) Oil storage capacity;
(C) Lack of secondary containment;

(D) Proximity to fish and wildlife and sensitive environments and other areas determined by the Regional Administrator to possess ecological value;

(E) Proximity to drinking water intakes;

(F) Spill history; and

(G) Other site-specific characteristics and environmental factors that the Regional Administrator determines to be relevant to protecting the environment from harm by discharges of oil into or on navigable waters or adjoining shorelines.

(ii) Any person, including a member of the public or any representative from a Federal, State, or local agency who believes that a facility subject to this section could, because of its location, reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines may petition the Regional Administrator to determine whether the facility meets the criteria in paragraph (f)(2)(i) of this section. Such petition shall include a discussion of how the factors in paragraph (f)(2)(i) of this section apply to the facility in question. The RA shall consider such petitions and respond in an appropriate amount of time.

(3) To determine whether a facility could, because of its location, reasonably be expected to cause significant and substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines, the Regional Administrator may consider the factors in paragraph (f)(2) of this section as well as the following:

(i) Frequency of past discharges;

(ii) Proximity to navigable waters;

(iii) Age of oil storage tanks; and

(iv) Other facility-specific and Region-specific information, including local impacts on public health.

(g)(1) All facility response plans shall be consistent with the requirements of the National Oil and Hazardous Substance Pollution Contingency Plan (40 CFR part 300) and applicable Area Contingency Plans prepared pursuant to section 311(j)(4) of the Clean Water Act. The facility response plan should be coordinated with the local emergency response plan developed by the local emergency planning committee under section 303 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. 11001 et seq.). Upon request, the owner or operator should provide a copy of the facility response plan to the local emergency planning committee or State emergency response commission.

(2) The owner or operator shall review relevant portions of the National Oil and Hazardous Substances Pollution Contingency Plan and applicable Area Contingency Plan annually and, if necessary, revise the facility response plan to ensure consistency with these plans.

(3) The owner or operator shall review and update the facility response plan periodically to reflect changes at the facility.

(h) A response plan shall follow the format of the model facility-specific response plan included in Appendix F to this part, unless you have prepared an equivalent response plan acceptable to the Regional Administrator to meet State or other Federal requirements. A response plan that does not follow the specified format in Appendix F to this part shall have an emergency response action plan as specified in paragraphs (h)(1) of this section and be supplemented with a cross-reference section to identify the location of the elements listed in paragraphs (h)(2) through (h)(10) of this section. To meet the requirements of this part, a response plan shall address the following elements, as further described in Appendix F to this part:

(1) Emergency response action plan. The response plan shall include an emergency response action plan in the format specified in paragraphs (h)(1)(i) through (viii) of this section that is maintained in the front of the response plan, or as a separate document accompanying the response plan, and that includes the following information:

(i) The identity and telephone number of a qualified individual having full authority, including contracting authority, to implement removal actions;

(ii) The identity of individuals or organizations to be contacted in the event of a discharge so that immediate communications between the qualified individual identified in paragraph (h)(1) of this section and the appropriate Federal officials and the persons providing response personnel and equipment can be ensured;

(iii) A description of information to pass to response personnel in the event of a reportable discharge;

(iv) A description of the facility's response equipment and its location;

(v) A description of response personnel capabilities, including the duties of persons at the facility during a response action and their response times and qualifications;

(vi) Plans for evacuation of the facility and a reference to community evacuation plans, as appropriate;

(vii) A description of immediate measures to secure the source of the discharge, and to provide adequate containment and drainage of discharged oil; and

(viii) A diagram of the facility.

(2) Facility information. The response plan shall identify and discuss the location and type of the facility, the identity and tenure of the present owner and operator, and the identity of the qualified individual identified in paragraph (h)(1) of this section.

(3) Information about emergency response. The response plan shall include:

(i) The identity of private personnel and equipment necessary to remove to the maximum extent practicable a worst case discharge and other discharges of oil described in paragraph (h)(5) of this section, and to mitigate or prevent a substantial threat of a worst case discharge (To identify response resources to meet the facility response plan requirements of this section, owners or operators shall follow Appendix E to this part or, where not appropriate, shall clearly demonstrate in the response plan why use of Appendix E of this part is not appropriate at the facility and make comparable arrangements for response resources);

(ii) Evidence of contracts or other approved means for ensuring the availability of such personnel and equipment;

(iii) The identity and the telephone number of individuals or organizations to be contacted in the event of a discharge so that immediate communications between the qualified individual identified in paragraph (h)(1) of this section and the appropriate Federal official and

the persons providing response personnel and equipment can be ensured;
(iv) A description of information to pass to response personnel in the event of a reportable discharge;
(v) A description of response personnel capabilities, including the duties of persons at the facility during a response action and their response times and qualifications;
(vi) A description of the facility's response equipment, the location of the equipment, and equipment testing;
(vii) Plans for evacuation of the facility and a reference to community evacuation plans, as appropriate;
(viii) A diagram of evacuation routes; and
(ix) A description of the duties of the qualified individual identified in paragraph (h)(1) of this section, that include:
(A) Activate internal alarms and hazard communication systems to notify all facility personnel;
(B) Notify all response personnel, as needed;
(C) Identify the character, exact source, amount, and extent of the release, as well as the other items needed for notification;
(D) Notify and provide necessary information to the appropriate Federal, State, and local authorities with designated response roles, including the National Response Center, State Emergency Response Commission, and Local Emergency Planning Committee;
(E) Assess the interaction of the discharged substance with water and/or other substances stored at the facility and notify response personnel at the scene of that assessment;
(F) Assess the possible hazards to human health and the environment due to the release. This assessment must consider both the direct and indirect effects of the release (i.e., the effects of any toxic, irritating, or asphyxiating gases that may be generated, or the effects of any hazardous surface water runoffs from water or chemical agents used to control fire and heat-induced explosion);
(G) Assess and implement prompt removal actions to contain and remove the substance released;
(H) Coordinate rescue and response actions as previously arranged with all response personnel;
(I) Use authority to immediately access company funding to initiate cleanup activities; and
(J) Direct cleanup activities until properly relieved of this responsibility.
(4) Hazard evaluation. The response plan shall discuss the facility's known or reasonably identifiable history of discharges reportable under 40 CFR part 110 for the entire life of the facility and shall identify areas within the facility where discharges could occur and what the potential effects of the discharges would be on the affected environment. To assess the range of areas potentially affected, owners or operators shall, where appropriate, consider the distance calculated in paragraph (f)(1)(ii) of this section to determine whether a facility could, because of its location, reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines.
(5) Response planning levels. The response plan shall include discussion

of specific planning scenarios for:
(i) A worst case discharge, as calculated using the appropriate worksheet in Appendix D to this part. In cases where the Regional Administrator determines that the worst case discharge volume calculated by the facility is not appropriate, the Regional Administrator may specify the worst case discharge amount to be used for response planning at the facility. For complexes, the worst case planning quantity shall be the larger of the amounts calculated for each component of the facility;
(ii) A discharge of 2,100 gallons or less, provided that this amount is less than the worst case discharge amount. For complexes, this planning quantity shall be the larger of the amounts calculated for each component of the facility; and
(iii) A discharge greater than 2,100 gallons and less than or equal to 36,000 gallons or 10 percent of the capacity of the largest tank at the facility, whichever is less, provided that this amount is less than the worst case discharge amount. For complexes, this planning quantity shall be the larger of the amounts calculated for each component of the facility.
(6) Discharge detection systems. The response plan shall describe the procedures and equipment used to detect discharges.
(7) Plan implementation. The response plan shall describe:
(i) Response actions to be carried out by facility personnel or contracted personnel under the response plan to ensure the safety of the facility and to mitigate or prevent discharges described in paragraph (h)(5) of this section or the substantial threat of such discharges;
(ii) A description of the equipment to be used for each scenario;
(iii) Plans to dispose of contaminated cleanup materials; and
(iv) Measures to provide adequate containment and drainage of discharged oil.
(8) Self-inspection, drills/exercises, and response training. The response plan shall include:
(i) A checklist and record of inspections for tanks, secondary containment, and response equipment;
(ii) A description of the drill/exercise program to be carried out under the response plan as described in §112.21;
(iii) A description of the training program to be carried out under the response plan as described in §112.21; and
(iv) Logs of discharge prevention meetings, training sessions, and drills/exercises. These logs may be maintained as an annex to the response plan.
(9) Diagrams. The response plan shall include site plan and drainage plan diagrams.
(10) Security systems. The response plan shall include a description of facility security systems.
(11) Response plan cover sheet. The response plan shall include a completed response plan cover sheet provided in Section 2.0 of Appendix F to this part.
(i)(1) In the event the owner or operator of a facility does not agree with the Regional Administrator's determination that the facility could, because of its location, reasonably be expected to cause substantial harm or significant and substantial harm to the environment by discharging oil

into or on the navigable waters or adjoining shorelines, or that amendments to the facility response plan are necessary prior to approval, such as changes to the worst case discharge planning volume, the owner or operator may submit a request for reconsideration to the Regional Administrator and provide additional information and data in writing to support the request. The request and accompanying information must be submitted to the Regional Administrator within 60 days of receipt of notice of the Regional Administrator's original decision. The Regional Administrator shall consider the request and render a decision as rapidly as practicable.

(2) In the event the owner or operator of a facility believes a change in the facility's classification status is warranted because of an unplanned event or change in the facility's characteristics (i.e., substantial harm or significant and substantial harm), the owner or operator may submit a request for reconsideration to the Regional Administrator and provide additional information and data in writing to support the request. The Regional Administrator shall consider the request and render a decision as rapidly as practicable.

(3) After a request for reconsideration under paragraph (i)(1) or (i)(2) of this section has been denied by the Regional Administrator, an owner or operator may appeal a determination made by the Regional Administrator. The appeal shall be made to the EPA Administrator and shall be made in writing within 60 days of receipt of the decision from the Regional Administrator that the request for reconsideration was denied. A complete copy of the appeal must be sent to the Regional Administrator at the time the appeal is made. The appeal shall contain a clear and concise statement of the issues and points of fact in the case. It also may contain additional information from the owner or operator, or from any other person. The EPA Administrator may request additional information from the owner or operator, or from any other person. The EPA Administrator shall render a decision as rapidly as practicable and shall notify the owner or operator of the decision.

[59 FR 34098, July 1, 1994, as amended at 65 FR 40798, June 30, 2000; 66 FR 34560, June 29, 2001; 67 FR 47151, July 17, 2002]

§ 112.21 Facility response training and drills/exercises.

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(a) The owner or operator of any facility required to prepare a facility response plan under §112.20 shall develop and implement a facility response training program and a drill/exercise program that satisfy the requirements of this section. The owner or operator shall describe the programs in the response plan as provided in §112.20(h)(8).

(b) The facility owner or operator shall develop a facility response training program to train those personnel involved in oil spill response activities. It is recommended that the training program be based on the USCG's Training Elements for Oil Spill Response, as applicable to facility operations. An alternative program can also be acceptable subject to approval by the Regional Administrator.

(1) The owner or operator shall be responsible for the proper instruction of facility personnel in the procedures to respond to discharges of oil and in applicable oil spill response laws, rules, and regulations.

(2) Training shall be functional in nature according to job tasks for both

supervisory and non-supervisory operational personnel.
(3) Trainers shall develop specific lesson plans on subject areas relevant to facility personnel involved in oil spill response and cleanup.
(c) The facility owner or operator shall develop a program of facility response drills/exercises, including evaluation procedures. A program that follows the National Preparedness for Response Exercise Program (PREP) (see Appendix E to this part, section 13, for availability) will be deemed satisfactory for purposes of this section. An alternative program can also be acceptable subject to approval by the Regional Administrator.
[59 FR 34101, July 1, 1994, as amended at 65 FR 40798, June 30, 2000]
Appendix A to Part 112—Memorandum of Understanding Between the Secretary of Transportation and the Administrator of the Environmental Protection Agency
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section ii—definitions
The Environmental Protection Agency and the Department of Transportation agree that for the purposes of Executive Order 11548, the term:
(1) Non-transportation-related onshore and offshore facilities means:
(A) Fixed onshore and offshore oil well drilling facilities including all equipment and appurtenances related thereto used in drilling operations for exploratory or development wells, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.
(B) Mobile onshore and offshore oil well drilling platforms, barges, trucks, or other mobile facilities including all equipment and appurtenances related thereto when such mobile facilities are fixed in position for the purpose of drilling operations for exploratory or development wells, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.
(C) Fixed onshore and offshore oil production structures, platforms, derricks, and rigs including all equipment and appurtenances related thereto, as well as completed wells and the wellhead separators, oil separators, and storage facilities used in the production of oil, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.
(D) Mobile onshore and offshore oil production facilities including all equipment and appurtenances related thereto as well as completed wells and wellhead equipment, piping from wellheads to oil separators, oil separators, and storage facilities used in the production of oil when such mobile facilities are fixed in position for the purpose of oil production operations, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.
(E) Oil refining facilities including all equipment and appurtenances related thereto as well as in-plant processing units, storage units, piping, drainage systems and waste treatment units used in the refining of oil, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.
(F) Oil storage facilities including all equipment and appurtenances

related thereto as well as fixed bulk plant storage, terminal oil storage facilities, consumer storage, pumps and drainage systems used in the storage of oil, but excluding inline or breakout storage tanks needed for the continuous operation of a pipeline system and any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(G) Industrial, commercial, agricultural or public facilities which use and store oil, but excluding any terminal facility, unit or process integrally associated with the handling or transferring of oil in bulk to or from a vessel.

(H) Waste treatment facilities including in-plant pipelines, effluent discharge lines, and storage tanks, but excluding waste treatment facilities located on vessels and terminal storage tanks and appurtenances for the reception of oily ballast water or tank washings from vessels and associated systems used for off-loading vessels.

(I) Loading racks, transfer hoses, loading arms and other equipment which are appurtenant to a nontransportation-related facility or terminal facility and which are used to transfer oil in bulk to or from highway vehicles or railroad cars.

(J) Highway vehicles and railroad cars which are used for the transport of oil exclusively within the confines of a nontransportation-related facility and which are not intended to transport oil in interstate or intrastate commerce.

(K) Pipeline systems which are used for the transport of oil exclusively within the confines of a nontransportation-related facility or terminal facility and which are not intended to transport oil in interstate or intrastate commerce, but excluding pipeline systems used to transfer oil in bulk to or from a vessel.

(2) Transportation-related onshore and offshore facilities means:

(A) Onshore and offshore terminal facilities including transfer hoses, loading arms and other equipment and appurtenances used for the purpose of handling or transferring oil in bulk to or from a vessel as well as storage tanks and appurtenances for the reception of oily ballast water or tank washings from vessels, but excluding terminal waste treatment facilities and terminal oil storage facilities.

(B) Transfer hoses, loading arms and other equipment appurtenant to a non-transportation-related facility which is used to transfer oil in bulk to or from a vessel.

(C) Interstate and intrastate onshore and offshore pipeline systems including pumps and appurtenances related thereto as well as in-line or breakout storage tanks needed for the continuous operation of a pipeline system, and pipelines from onshore and offshore oil production facilities, but excluding onshore and offshore piping from wellheads to oil separators and pipelines which are used for the transport of oil exclusively within the confines of a nontransportation-related facility or terminal facility and which are not intended to transport oil in interstate or intrastate commerce or to transfer oil in bulk to or from a vessel.

(D) Highway vehicles and railroad cars which are used for the transport of oil in interstate or intrastate commerce and the equipment and appurtenances related thereto, and equipment used for the fueling of locomotive units, as well as the rights-of-way on which they operate.

Excluded are highway vehicles and railroad cars and motive power used exclusively within the confines of a nontransportation-related facility or terminal facility and which are not intended for use in interstate or intrastate commerce.

Appendix B to Part 112—Memorandum of Understanding Among the Secretary of the Interior, Secretary of Transportation, and Administrator of the Environmental Protection Agency

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Purpose

This Memorandum of Understanding (MOU) establishes the jurisdictional responsibilities for offshore facilities, including pipelines, pursuant to section 311 (j)(1)(c), (j)(5), and (j)(6)(A) of the Clean Water Act (CWA), as amended by the Oil Pollution Act of 1990 (Public Law 101–380). The Secretary of the Department of the Interior (DOI), Secretary of the Department of Transportation (DOT), and Administrator of the Environmental Protection Agency (EPA) agree to the division of responsibilities set forth below for spill prevention and control, response planning, and equipment inspection activities pursuant to those provisions.

Background

Executive Order (E.O.) 12777 (56 FR 54757) delegates to DOI, DOT, and EPA various responsibilities identified in section 311(j) of the CWA. Sections 2(b)(3), 2(d)(3), and 2(e)(3) of E.O. 12777 assigned to DOI spill prevention and control, contingency planning, and equipment inspection activities associated with offshore facilities. Section 311(a)(11) defines the term “offshore facility” to include facilities of any kind located in, on, or under navigable waters of the United States. By using this definition, the traditional DOI role of regulating facilities on the Outer Continental Shelf is expanded by E.O. 12777 to include inland lakes, rivers, streams, and any other inland waters.

Responsibilities

Pursuant to section 2(i) of E.O. 12777, DOI redelegates, and EPA and DOT agree to assume, the functions vested in DOI by sections 2(b)(3), 2(d)(3), and 2(e)(3) of E.O. 12777 as set forth below. For purposes of this MOU, the term “coast line” shall be defined as in the Submerged Lands Act (43 U.S.C. 1301(c)) to mean “the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters.”

1. To EPA, DOI redelegates responsibility for non-transportation-related offshore facilities located landward of the coast line.
2. To DOT, DOI redelegates responsibility for transportation-related facilities, including pipelines, located landward of the coast line. The DOT retains jurisdiction for deepwater ports and their associated seaward pipelines, as delegated by E.O. 12777.
3. The DOI retains jurisdiction over facilities, including pipelines, located seaward of the coast line, except for deepwater ports and associated seaward pipelines delegated by E.O. 12777 to DOT.

Effective Date

This MOU is effective on the date of the final execution by the indicated signatories.

Limitations

1. The DOI, DOT, and EPA may agree in writing to exceptions to this MOU on

a facility-specific basis. Affected parties will receive notification of
the exceptions.
2. Nothing in this MOU is intended to replace, supersede, or modify any existing agreements between or among DOI, DOT, or EPA.

Modification and Termination

Any party to this agreement may propose modifications by submitting them in writing to the heads of the other agency/department. No modification may be adopted except with the consent of all parties. All parties shall indicate their consent to or disagreement with any proposed modification within 60 days of receipt. Upon the request of any party, representatives of all parties shall meet for the purpose of considering exceptions or modifications to this agreement. This MOU may be terminated only with the mutual consent of all parties.

Dated: November 8, 1993.
Bruce Babbitt,
Secretary of the Interior.
Dated: December 14, 1993.
Federico Peña,
Secretary of Transportation.
Dated: February 3, 1994.
Carol M. Browner,
Administrator, Environmental Protection Agency.
[59 FR 34102, July 1, 1994]

Appendix C to Part 112—Substantial Harm Criteria

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1.0 Introduction

The flowchart provided in Attachment C–I to this appendix shows the decision tree with the criteria to identify whether a facility "could reasonably be expected to cause substantial harm to the environment by discharging into or on the navigable waters or adjoining shorelines." In addition, the Regional Administrator has the discretion to identify facilities that must prepare and submit facility-specific response plans to EPA.

1.1 Definitions

1.1.1 Great Lakes means Lakes Superior, Michigan, Huron, Erie, and Ontario, their connecting and tributary waters, the Saint Lawrence River as far as Saint Regis, and adjacent port areas.

1.1.2 Higher Volume Port Areas include
(1) Boston, MA;
(2) New York, NY;
(3) Delaware Bay and River to Philadelphia, PA;
(4) St. Croix, VI;
(5) Pascagoula, MS;
(6) Mississippi River from Southwest Pass, LA to Baton Rouge, LA;
(7) Louisiana Offshore Oil Port (LOOP), LA;
(8) Lake Charles, LA;
(9) Sabine-Neches River, TX;
(10) Galveston Bay and Houston Ship Channel, TX;
(11) Corpus Christi, TX;
(12) Los Angeles/Long Beach Harbor, CA;
(13) San Francisco Bay, San Pablo Bay, Carquinez Strait, and Suisun Bay to

Antioch, CA;
(14) Straits of Juan de Fuca from Port Angeles, WA to and including Puget Sound, WA;
(15) Prince William Sound, AK; and
(16) Others as specified by the Regional Administrator for any EPA Region.

1.1.3 Inland Area means the area shoreward of the boundary lines defined in 46 CFR part 7, except in the Gulf of Mexico. In the Gulf of Mexico, it means the area shoreward of the lines of demarcation (COLREG lines as defined in 33 CFR 80.740–80.850). The inland area does not include the Great Lakes.

1.1.4 Rivers and Canals means a body of water confined within the inland area, including the Intracoastal Waterways and other waterways artificially created for navigating that have project depths of 12 feet or less.

2.0 Description of Screening Criteria for the Substantial Harm Flowchart

A facility that has the potential to cause substantial harm to the environment in the event of a discharge must prepare and submit a facility-specific response plan to EPA in accordance with Appendix F to this part. A description of the screening criteria for the substantial harm flowchart is provided below:

2.1 Non-Transportation-Related Facilities With a Total Oil Storage Capacity Greater Than or Equal to 42,000 Gallons Where Operations Include Over-Water Transfers of Oil. A non-transportation-related facility with a total oil storage capacity greater than or equal to 42,000 gallons that transfers oil over water to or from vessels must submit a response plan to EPA. Daily oil transfer operations at these types of facilities occur between barges and vessels and onshore bulk storage tanks over open water. These facilities are located adjacent to navigable water.

2.2 Lack of Adequate Secondary Containment at Facilities With a Total Oil Storage Capacity Greater Than or Equal to 1 Million Gallons. Any facility with a total oil storage capacity greater than or equal to 1 million gallons without secondary containment sufficiently large to contain the capacity of the largest aboveground oil storage tank within each area plus sufficient freeboard to allow for precipitation must submit a response plan to EPA. Secondary containment structures that meet the standard of good engineering practice for the purposes of this part include berms, dikes, retaining walls, curbing, culverts, gutters, or other drainage systems.

2.3 Proximity to Fish and Wildlife and Sensitive Environments at Facilities With a Total Oil Storage Capacity Greater Than or Equal to 1 Million Gallons. A facility with a total oil storage capacity greater than or equal to 1 million gallons must submit its response plan if it is located at a distance such that a discharge from the facility could cause injury (as defined at 40 CFR 112.2) to fish and wildlife and sensitive environments. For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's “Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments” (see Appendix E to this part, section 13, for availability) and the applicable Area Contingency Plan. Facility owners or operators must determine the distance at which an oil discharge could cause injury to fish and wildlife and sensitive environments using the appropriate formula presented in Attachment C–III to this appendix or a comparable formula.

2.4 Proximity to Public Drinking Water Intakes at Facilities with a Total Oil Storage Capacity Greater than or Equal to 1 Million Gallons A facility with a total oil storage capacity greater than or equal to 1 million gallons must submit its response plan if it is located at a distance such that a discharge from the facility would shut down a public drinking water intake, which is analogous to a public water system as described at 40 CFR 143.2(c). The distance at which an oil discharge from an SPCC-regulated facility would shut down a public drinking water intake shall be calculated using the appropriate formula presented in Attachment C–III to this appendix or a comparable formula.

2.5 Facilities That Have Experienced Reportable Oil Discharges in an Amount Greater Than or Equal to 10,000 Gallons Within the Past 5 Years and That Have a Total Oil Storage Capacity Greater Than or Equal to 1 Million Gallons. A facility's oil spill history within the past 5 years shall be considered in the evaluation for substantial harm. Any facility with a total oil storage capacity greater than or equal to 1 million gallons that has experienced a reportable oil discharge in an amount greater than or equal to 10,000 gallons within the past 5 years must submit a response plan to EPA.

3.0 Certification for Facilities That Do Not Pose Substantial Harm

If the facility does not meet the substantial harm criteria listed in Attachment C–I to this appendix, the owner or operator shall complete and maintain at the facility the certification form contained in Attachment C–II to this appendix. In the event an alternative formula that is comparable to the one in this appendix is used to evaluate the substantial harm criteria, the owner or operator shall attach documentation to the certification form that demonstrates the reliability and analytical soundness of the comparable formula and shall notify the Regional Administrator in writing that an alternative formula was used.

4.0 References

Chow, V.T. 1959. Open Channel Hydraulics. McGraw Hill.

USCG IFR (58 FR 7353, February 5, 1993). This document is available through EPA's rulemaking docket as noted in Appendix E to this part, section 13.

Attachments to Appendix C

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Attachment C-II—Certification of the Applicability of the Substantial Harm Criteria

Facility Name:____________________

Facility Address:____________________

1. Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?

Yes ___ No ___

2. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is sufficiently large to contain the capacity of the

largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation within any aboveground oil storage tank area?

Yes ___ No ___

3. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Attachment C–III to this appendix or a comparable formula 1) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments? For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's "Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments" (see Appendix E to this part, section 13, for availability) and the applicable Area Contingency Plan.

Yes ___ No ___

4. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Attachment C-III to this appendix or a comparable formula 1) such that a discharge from the facility would shut down a public drinking water intake 2 ?

1 If a comparable formula is used, documentation of the reliability and analytical soundness of the comparable formula must be attached to this form.

2 For the purposes of 40 CFR part 112, public drinking water intakes are analogous to public water systems as described at 40 CFR 143.2(c).

Yes ___ No ___

5. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil discharge in an amount greater than or equal to 10,000 gallons within the last 5 years?

Yes ___ No ___

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

____

Signature

____

Name (please type or print)

____

Title

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Date

Attachment C-III—Calculation of the Planning Distance

1.0 Introduction

1.1 The facility owner or operator must evaluate whether the facility is located at a distance such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments or disrupt operations at a public drinking water intake. To quantify that distance, EPA considered oil transport mechanisms over land and on still, tidal influence, and moving navigable waters. EPA has determined that the primary concern for calculation of a planning distance is the transport of oil in navigable waters during adverse weather conditions. Therefore, two formulas have been developed to determine distances for planning purposes from the point of discharge at the facility to the potential site of impact on moving and still waters, respectively. The formula for oil transport on moving navigable water is based on the velocity of the water body and the time interval for arrival of response resources. The still water formula accounts for the spread of discharged oil over the surface of the water. The method to determine oil transport on tidal influence areas is based on the type of oil discharged and the distance down current during ebb tide and up current during flood tide to the point of maximum tidal influence.

1.2 EPA's formulas were designed to be simple to use. However, facility owners or operators may calculate planning distances using more sophisticated formulas, which take into account broader scientific or engineering principles, or local conditions. Such comparable formulas may result in different planning distances than EPA's formulas. In the event that an alternative formula that is comparable to one contained in this appendix is used to evaluate the criterion in 40 CFR 112.20(f)(1)(ii)(B) or (f)(1)(ii)(C), the owner or operator shall attach documentation to the response plan cover sheet contained in Appendix F to this part that demonstrates the reliability and analytical soundness of the alternative formula and shall notify the Regional Administrator in writing that an alternative formula was used. 1

1 For persistent oils or non-persistent oils, a worst case trajectory model (i.e., an alternative formula) may be substituted for the distance formulas described in still, moving, and tidal waters, subject to Regional Administrator's review of the model. An example of an alternative formula that is comparable to the one contained in this appendix would be a worst case trajectory calculation based on credible adverse winds, currents, and/or river stages, over a range of seasons, weather conditions, and river stages. Based on historical information or a spill trajectory model, the Agency may require that additional fish and wildlife and sensitive environments or public drinking water intakes also be protected.

1.3 A regulated facility may meet the criteria for the potential to cause substantial harm to the environment without having to perform a planning distance calculation. For facilities that meet the substantial harm criteria because of inadequate secondary containment or oil spill history, as listed in the flowchart in Attachment C–I to this appendix, calculation of the planning distance is unnecessary. For facilities that do not meet the substantial harm criteria for secondary containment or oil spill history as listed in the flowchart, calculation of a planning distance for proximity to fish and wildlife and sensitive environments and public drinking water intakes is required, unless it is clear without performing the calculation (e.g., the facility is located in a wetland) that these areas would be impacted.

1.4 A facility owner or operator who must perform a planning distance calculation on navigable water is only required to do so for the type of navigable water conditions (i.e., moving water, still water, or tidal-influenced water) applicable to the facility. If a facility owner or operator determines that more than one type of navigable water condition applies, then the facility owner or operator is required to perform a planning distance calculation for each navigable water type to determine the greatest single distance that oil may be transported. As a result, the final planning distance for oil transport on water shall be the greatest individual distance rather than a summation of each calculated planning distance.

1.5 The planning distance formula for transport on moving waterways contains three variables: the velocity of the navigable water (v), the response time interval (t), and a conversion factor (c). The velocity, v, is determined by using the Chezy-Manning equation, which, in this case, models the flood flow rate of water in open channels. The Chezy-Manning equation contains three variables which must be determined by facility owners or operators. Manning's Roughness Coefficient (for flood flow rates), n, can be determined from Table 1 of this attachment. The hydraulic radius, r, can be estimated using the average mid-channel depth from charts provided by the sources listed in Table 2 of this attachment. The average slope of the river, s, can be determined using topographic maps that can be ordered from the U.S. Geological Survey, as listed in Table 2 of this attachment.

1.6 Table 3 of this attachment contains specified time intervals for estimating the arrival of response resources at the scene of a discharge. Assuming no prior planning, response resources should be able to arrive at the discharge site within 12 hours of the discovery of any oil discharge in Higher Volume Port Areas and within 24 hours in Great Lakes and all other river, canal, inland, and nearshore areas. The specified time intervals in Table 3 of Appendix C are to be used only to aid in the identification of whether a facility could cause substantial harm to the environment. Once it is determined that a plan must be developed for the facility, the owner or operator shall reference Appendix E to this part to determine appropriate resource levels and response times. The specified time intervals of this appendix include a 3-hour time period for deployment of boom and other response equipment. The Regional Administrator may identify additional areas as appropriate.

2.0 Oil Transport on Moving Navigable Waters

2.1 The facility owner or operator must use the following formula or a comparable formula as described in §112.20(a)(3) to calculate the planning distance for oil transport on moving navigable water:

$d = v \times t \times c$; where

d: the distance downstream from a facility within which fish and wildlife and sensitive environments could be injured or a public drinking water intake would be shut down in the event of an oil discharge (in miles);

v: the velocity of the river/navigable water of concern (in ft/sec) as determined by Chezy-Manning's equation (see below and Tables 1 and 2 of this attachment);

t: the time interval specified in Table 3 based upon the type of water body and location (in hours); and c: constant conversion factor 0.68 secω mile/hrω ft (3600 sec/hr ÷ 5280 ft/mile).

2.2 Chezy-Manning's equation is used to determine velocity:

v=1.5/n×r 2/3×s 1/2; where

v=the velocity of the river of concern (in ft/sec);

n=Manning's Roughness Coefficient from Table 1 of this attachment;

r=the hydraulic radius; the hydraulic radius can be approximated for parabolic channels by multiplying the average mid-channel depth of the river (in feet) by 0.667 (sources for obtaining the mid-channel depth are listed in Table 2 of this attachment); and

s=the average slope of the river (unitless) obtained from U.S. Geological Survey topographic maps at the address listed in Table 2 of this attachment.

Table 1_Manning's Roughness Coefficient for Natural Streams

[Note: Coefficients are presented for high flow rates at or near flood stage.]

Stream description	Roughness coefficient (n)
Minor Streams (Top Width <100 ft.)	
Clean:	
Straight..	0.03
Winding..	0.04
Sluggish (Weedy, deep pools):	
No trees or brush.......................................	0.06
Trees and/or brush......................................	0.10
Major Streams (Top Width >100 ft.)	
Regular section:	
(No boulders/brush).....................................	0.035
Irregular section:	
(Brush)...	0.05

Table 2—Sources of r and s for the Chezy-Manning Equation

All of the charts and related publications for navigational waters may be ordered from:

Distribution Branch

(N/CG33)

National Ocean Service

Riverdale, Maryland 20737–1199

Phone: (301) 436–6990

There will be a charge for materials ordered and a VISA or Mastercard will be accepted.

The mid-channel depth to be used in the calculation of the hydraulic radius (r) can be obtained directly from the following sources:

Charts of Canadian Coastal and Great Lakes Waters:

Canadian Hydrographic Service

Department of Fisheries and Oceans Institute

P.O. Box 8080
1675 Russell Road
Ottawa, Ontario KIG 3H6
Canada
Phone: (613) 998–4931
Charts and Maps of Lower Mississippi River
(Gulf of Mexico to Ohio River and St. Francis, White, Big Sunflower, Atchafalaya, and other rivers):
U.S. Army Corps of Engineers
Vicksburg District
P.O. Box 60
Vicksburg, Mississippi 39180
Phone: (601) 634–5000
Charts of Upper Mississippi River and Illinois Waterway to Lake Michigan:
U.S. Army Corps of Engineers
Rock Island District
P.O. Box 2004
Rock Island, Illinois 61204
Phone: (309) 794–5552
Charts of Missouri River:
U.S. Army Corps of Engineers
Omaha District
6014 U.S. Post Office and Courthouse
Omaha, Nebraska 68102
Phone: (402) 221–3900
Charts of Ohio River:
U.S. Army Corps of Engineers
Ohio River Division
P.O. Box 1159
Cincinnati, Ohio 45201
Phone: (513) 684–3002
Charts of Tennessee Valley Authority Reservoirs, Tennessee River and Tributaries:
Tennessee Valley Authority
Maps and Engineering Section
416 Union Avenue
Knoxville, Tennessee 37902
Phone: (615) 632–2921
Charts of Black Warrior River, Alabama River, Tombigbee River, Apalachicola River and Pearl River:
U.S. Army Corps of Engineers
Mobile District
P.O. Box 2288
Mobile, Alabama 36628–0001
Phone: (205) 690–2511
The average slope of the river (s) may be obtained from topographic maps:
U.S. Geological Survey
Map Distribution
Federal Center
Bldg. 41
Box 25286

Denver, Colorado 80225

Additional information can be obtained from the following sources:

1. The State's Department of Natural Resources (DNR) or the State's Aids to Navigation office;
2. A knowledgeable local marina operator; or
3. A knowledgeable local water authority (e.g., State water commission)

2.3 The average slope of the river (s) can be determined from the topographic maps using the following steps:

(1) Locate the facility on the map.

(2) Find the Normal Pool Elevation at the point of discharge from the facility into the water (A).

(3) Find the Normal Pool Elevation of the public drinking water intake or fish and wildlife and sensitive environment located downstream (B) (Note: The owner or operator should use a minimum of 20 miles downstream as a cutoff to obtain the average slope if the location of a specific public drinking water intake or fish and wildlife and sensitive environment is unknown).

(4) If the Normal Pool Elevation is not available, the elevation contours can be used to find the slope. Determine elevation of the water at the point of discharge from the facility (A). Determine the elevation of the water at the appropriate distance downstream (B). The formula presented below can be used to calculate the slope.

(5) Determine the distance (in miles) between the facility and the public drinking water intake or fish and wildlife and sensitive environments (C).

(6) Use the following formula to find the slope, which will be a unitless value: Average Slope=[(A−B) (ft)/C (miles)] × [1 mile/5280 feet]

2.4 If it is not feasible to determine the slope and mid-channel depth by the Chezy-Manning equation, then the river velocity can be approximated on- site. A specific length, such as 100 feet, can be marked off along the shoreline. A float can be dropped into the stream above the mark, and the time required for the float to travel the distance can be used to determine the velocity in feet per second. However, this method will not yield an average velocity for the length of the stream, but a velocity only for the specific location of measurement. In addition, the flow rate will vary depending on weather conditions such as wind and rainfall. It is recommended that facility owners or operators repeat the measurement under a variety of conditions to obtain the most accurate estimate of the surface water velocity under adverse weather conditions.

2.5 The planning distance calculations for moving and still navigable waters are based on worst case discharges of persistent oils. Persistent oils are of concern because they can remain in the water for significant periods of time and can potentially exist in large quantities downstream. Owners or operators of facilities that store persistent as well as non-persistent oils may use a comparable formula. The volume of oil discharged is not included as part of the planning distance calculation for moving navigable waters. Facilities that will meet this substantial harm criterion are those with facility capacities greater than or equal to 1 million gallons. It is assumed that these facilities are capable of having an oil discharge of sufficient quantity to cause injury to fish and wildlife and sensitive environments or shut down a public drinking water intake. While owners or operators of transfer facilities that store greater than or equal to 42,000 gallons are not required to use a planning distance formula for purposes of the substantial harm criteria, they should use a planning distance calculation in the development of facility-specific response plans.

Table 3_Specified Time Intervals

Operating areas	Substantial harm planning time (hrs)
Higher volume port area..................	12 hour arrival+3 hour deployment=15 hours.
Great Lakes..............................	24 hour arrival+3 hour deployment=27 hours.
All other rivers and canals, inland, and nearshore areas.	24 hour arrival+3 hour deployment=27 hours.

2.6 Example of the Planning Distance Calculation for Oil Transport on Moving Navigable Waters. The following example provides a sample calculation using the planning distance formula for a facility discharging oil into the Monongahela River:

(1) Solve for v by evaluating n, r, and s for the Chezy-Manning equation:
Find the roughness coefficient, n, on Table 1 of this attachment for a regular section of a major stream with a top width greater than 100 feet. The top width of the river can be found from the topographic map.
n=0.035.
Find slope, s, where A=727 feet, B=710 feet, and C=25 miles.
Solving:
s=[(727 ft−1710 ft)/25 miles]×[1 mile/5280 feet]=1.3×10−4
The average mid-channel depth is found by averaging the mid-channel depth for each mile along the length of the river between the facility and the public drinking water intake or the fish or wildlife or sensitive environment (or 20 miles downstream if applicable). This value is multiplied by 0.667 to obtain the hydraulic radius. The mid-channel depth is found by obtaining values for r and s from the sources shown in Table 2 for the Monongahela River.
Solving:
r=0.667×20 feet=13.33 feet
Solve for v using:
v=1.5/n×r2/3×s1/2:
v=[1.5/0.035]×(13.33)2/3×(1.3×10−4)1/2
v=2.73 feet/second
(2) Find t from Table 3 of this attachment. The Monongahela River's resource response time is 27 hours.
(3) Solve for planning distance, d:
d=v×t×c
d=(2.73 ft/sec)×(27 hours)×(0.68 secω mile/hrω ft)
d=50 miles
Therefore, 50 miles downstream is the appropriate planning distance for

this facility.

3.0 Oil Transport on Still Water

3.1 For bodies of water including lakes or ponds that do not have a measurable velocity, the spreading of the oil over the surface must be considered. Owners or operators of facilities located next to still water bodies may use a comparable means of calculating the planning distance. If a comparable formula is used, documentation of the reliability and analytical soundness of the comparable calculation must be attached to the response plan cover sheet.

3.2 Example of the Planning Distance Calculation for Oil Transport on Still Water. To assist those facilities which could potentially discharge into a still body of water, the following analysis was performed to provide an example of the type of formula that may be used to calculate the planning distance. For this example, a worst case discharge of 2,000,000 gallons is used.

(1) The surface area in square feet covered by an oil discharge on still water, A1, can be determined by the following formula, 2 where V is the volume of the discharge in gallons and C is a constant conversion factor:

2 Huang, J.C. and Monastero, F.C., 1982. Review of the State-of-the-Art of Oil Pollution Models. Final report submitted to the American Petroleum Institute by Raytheon Ocean Systems, Co., East Providence, Rhode Island.

A1=10 5 ×V 3/4×C

C=0.1643

A1=10 5 ×(2,000,000 gallons) 3/4×(0.1643)

A1=8.74×10 8 ft 2

(2) The spreading formula is based on the theoretical condition that the oil will spread uniformly in all directions forming a circle. In reality, the outfall of the discharge will direct the oil to the surface of the water where it intersects the shoreline. Although the oil will not spread uniformly in all directions, it is assumed that the discharge will spread from the shoreline into a semi-circle (this assumption does not account for winds or wave action).

(3) The area of a circle=† r 2

(4) To account for the assumption that oil will spread in a semi-circular shape, the area of a circle is divided by 2 and is designated as A2.

A2=(† r 2)/2

Solving for the radius, r, using the relationship A1=A2: 8.74×10 8 ft 2 =(† 2)/2

Therefore, r=23,586 ft

r=23,586 ft÷5,280 ft/mile=4.5 miles

Assuming a 20 knot wind under storm conditions:

1 knot=1.15 miles/hour

20 knots×1.15 miles/hour/knot=23 miles/hr

Assuming that the oil slick moves at 3 percent of the wind's speed: 3

3 Oil Spill Prevention & Control. National Spill Control School, Corpus Christi State University, Thirteenth Edition, May 1990.

23 miles/hour×0.03=0.69 miles/hour

(5) To estimate the distance that the oil will travel, use the times required for response resources to arrive at different geographic locations as shown in Table 3 of this attachment.

For example:

For Higher Volume Port Areas: 15 hrs×0.69 miles/hr=10.4 miles
For Great Lakes and all other areas: 27 hrs×0.69 miles/hr=18.6 miles

(6) The total distance that the oil will travel from the point of discharge, including the distance due to spreading, is calculated as follows:

Higher Volume Port Areas: d=10.4+4.5 miles or approximately 15 miles
Great Lakes and all other areas: d=18.6+4.5 miles or approximately 23 miles

4.0 Oil Transport on Tidal-Influence Areas

4.1 The planning distance method for tidal influence navigable water is based on worst case discharges of persistent and non-persistent oils. Persistent oils are of primary concern because they can potentially cause harm over a greater distance. For persistent oils discharged into tidal waters, the planning distance is 15 miles from the facility down current during ebb tide and to the point of maximum tidal influence or 15 miles, whichever is less, during flood tide.

4.2 For non-persistent oils discharged into tidal waters, the planning distance is 5 miles from the facility down current during ebb tide and to the point of maximum tidal influence or 5 miles, whichever is less, during flood tide.

4.3 Example of Determining the Planning Distance for Two Types of Navigable Water Conditions. Below is an example of how to determine the proper planning distance when a facility could impact two types of navigable water conditions: moving water and tidal water.

(1) Facility X stores persistent oil and is located downstream from locks along a slow moving river which is affected by tides. The river velocity, v, is determined to be 0.5 feet/second from the Chezy-Manning equation used to calculate oil transport on moving navigable waters. The specified time interval, t, obtained from Table 3 of this attachment for river areas is 27 hours. Therefore, solving for the planning distance, d:

d=v×t×c
d=(0.5 ft/sec)×(27 hours)×(0.68 secmile/hrft)
d=9.18 miles.

(2) However, the planning distance for maximum tidal influence down current during ebb tide is 15 miles, which is greater than the calculated 9.18 miles. Therefore, 15 miles downstream is the appropriate planning distance for this facility.

5.0 Oil Transport Over Land

5.1 Facility owners or operators must evaluate the potential for oil to be transported over land to navigable waters of the United States. The owner or operator must evaluate the likelihood that portions of a worst case discharge would reach navigable waters via open channel flow or from sheet flow across the land, or be prevented from reaching navigable waters when trapped in natural or man-made depressions excluding secondary containment structures.

5.2 As discharged oil travels over land, it may enter a storm drain or open concrete channel intended for drainage. It is assumed that once oil reaches such an inlet, it will flow into the receiving navigable water. During a storm event, it is highly probable that the oil will either flow into the drainage structures or follow the natural contours of the land and flow into the navigable water. Expected minimum and maximum velocities are provided as examples of open concrete channel and pipe flow. The ranges listed below reflect minimum and maximum velocities used as design criteria. 4 The calculation below demonstrates that the time required for oil to travel through a storm drain or open concrete channel to navigable water is negligible and can be considered instantaneous. The velocities are:

4 The design velocities were obtained from Howard County, Maryland Department of Public Works' Storm Drainage Design Manual.

For open concrete channels:

maximum velocity=25 feet per second

minimum velocity=3 feet per second

For storm drains:

maximum velocity=25 feet per second

minimum velocity=2 feet per second

5.3 Assuming a length of 0.5 mile from the point of discharge through an open concrete channel or concrete storm drain to a navigable water, the travel times (distance/velocity) are:

1.8 minutes at a velocity of 25 feet per second

14.7 minutes at a velocity of 3 feet per second

22.0 minutes for at a velocity of 2 feet per second

5.4 The distances that shall be considered to determine the planning distance are illustrated in Figure C-I of this attachment. The relevant distances can be described as follows:

D1=Distance from the nearest opportunity for discharge, X1, to a storm drain or an open concrete channel leading to navigable water.

D2=Distance through the storm drain or open concrete channel to navigable water.

D3=Distance downstream from the outfall within which fish and wildlife and sensitive environments could be injured or a public drinking water intake would be shut down as determined by the planning distance formula.

D4=Distance from the nearest opportunity for discharge, X2, to fish and wildlife and sensitive environments not bordering navigable water.

5.5 A facility owner or operator whose nearest opportunity for discharge is located within 0.5 mile of a navigable water must complete the planning distance calculation (D3) for the type of navigable water near the facility or use a comparable formula.

5.6 A facility that is located at a distance greater than 0.5 mile from a navigable water must also calculate a planning distance (D3) if it is in close proximity (i.e., D1 is less than 0.5 mile and other factors are conducive to oil travel over land) to storm drains that flow to navigable waters. Factors to be considered in assessing oil transport over land to storm drains shall include the topography of the surrounding area, drainage patterns, man-made barriers (excluding secondary containment structures), and soil distribution and porosity. Storm drains or concrete drainage channels that are located in close proximity to the facility can provide a direct pathway to navigable waters, regardless of the length of the drainage pipe. If D1 is less than or equal to 0.5 mile, a discharge from the facility could pose substantial harm because the time to travel the distance from the storm drain to the navigable water (D2) is virtually instantaneous.

5.7 A facility's proximity to fish and wildlife and sensitive environments not bordering a navigable water, as depicted as D4 in Figure C–I of this attachment, must also be considered, regardless of the distance from the facility to navigable waters. Factors to be considered in assessing oil transport over land to fish and wildlife and sensitive environments should include the topography of the surrounding area, drainage patterns, man-made barriers (excluding secondary containment structures), and soil distribution and porosity.

5.8 If a facility is not found to pose substantial harm to fish and wildlife and sensitive environments not bordering navigable waters via oil transport on land, then supporting documentation should be maintained at the facility. However, such documentation should be submitted with the response plan if a facility is found to pose substantial harm.

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[59 FR 34102, July 1, 1994, as amended at 65 FR 40798, June 30, 2000; 67 FR 47152, July 17, 2002]

Appendix D to Part 112—Determination of a Worst Case Discharge Planning Volume

top

1.0 Instructions

1.1 An owner or operator is required to complete this worksheet if the facility meets the criteria, as presented in Appendix C to this part, or it is determined by the RA that the facility could cause substantial harm to the environment. The calculation of a worst case discharge planning volume is used for emergency planning purposes, and is required in 40 CFR 112.20 for facility owners or operators who must prepare a response plan. When planning for the amount of resources and equipment necessary to respond to the worst case discharge planning volume, adverse weather conditions must be taken into consideration. An owner or operator is required to determine the facility's worst case discharge planning volume from either part A of this appendix for an onshore storage facility, or part B of this appendix for an onshore production facility. The worksheet considers the provision of adequate secondary containment at a facility.

1.2 For onshore storage facilities and production facilities, permanently manifolded oil storage tanks are defined as tanks that are designed, installed, and/or operated in such a manner that the multiple tanks function as one storage unit (i.e., multiple tank volumes are equalized). In a worst case discharge scenario, a single failure could cause the discharge of the contents of more than one tank. The owner or operator must provide evidence in the response plan that tanks with common piping or piping systems are not operated as one unit. If such evidence is provided and is acceptable to the RA, the worst case discharge planning volume would be based on the capacity of the largest oil storage tank within a common secondary containment area or the largest oil storage tank within a single secondary containment area, whichever is greater. For permanently manifolded tanks that function as one oil storage unit, the worst case discharge planning volume would be based on the combined oil storage capacity of all manifolded tanks or the capacity of the largest single oil storage tank within a secondary containment area, whichever is greater. For purposes of this rule, permanently manifolded tanks that are separated by internal divisions for each tank are considered to be single

tanks and individual manifolded tank volumes are not combined.
1.3 For production facilities, the presence of exploratory wells, production wells, and oil storage tanks must be considered in the calculation. Part B of this appendix takes these additional factors into consideration and provides steps for their inclusion in the total worst case discharge planning volume. Onshore oil production facilities may include all wells, flowlines, separation equipment, storage facilities, gathering lines, and auxiliary non-transportation-related equipment and facilities in a single geographical oil or gas field operated by a single operator. Although a potential worst case discharge planning volume is calculated within each section of the worksheet, the final worst case amount depends on the risk parameter that results in the greatest volume.
1.4 Marine transportation-related transfer facilities that contain fixed aboveground onshore structures used for bulk oil storage are jointly regulated by EPA and the U.S. Coast Guard (USCG), and are termed "complexes." Because the USCG also requires response plans from transportation-related facilities to address a worst case discharge of oil, a separate calculation for the worst case discharge planning volume for USCG-related facilities is included in the USCG IFR (see Appendix E to this part, section 13, for availability). All complexes that are jointly regulated by EPA and the USCG must compare both calculations for worst case discharge planning volume derived by using the EPA and USCG methodologies and plan for whichever volume is greater.

PART A: WORST CASE DISCHARGE PLANNING VOLUME CALCULATION FOR ONSHORE STORAGE FACILITIES 1

1 "Storage facilities" represent all facilities subject to this part, excluding oil production facilities.

Part A of this worksheet is to be completed by the owner or operator of an SPCC-regulated facility (excluding oil production facilities) if the facility meets the criteria as presented in Appendix C to this part, or if it is determined by the RA that the facility could cause substantial harm to the environment. If you are the owner or operator of a production facility, please proceed to part B of this worksheet.

A.1 SINGLE-TANK FACILITIES

For facilities containing only one aboveground oil storage tank, the worst case discharge planning volume equals the capacity of the oil storage tank. If adequate secondary containment (sufficiently large to contain the capacity of the aboveground oil storage tank plus sufficient freeboard to allow for precipitation) exists for the oil storage tank, multiply the capacity of the tank by 0.8.

(1) FINAL WORST CASE VOLUME: ____ GAL
(2) Do not proceed further.

A.2 SECONDARY CONTAINMENT—MULTIPLE-TANK FACILITIES

Are all aboveground oil storage tanks or groups of aboveground oil storage tanks at the facility without adequate secondary containment? 2

2 Secondary containment is described in 40 CFR part 112, subparts A through C. Acceptable methods and structures for containment are also given in 40 CFR 112.7(c)(1).

____ (Y/N)

A.2.1 If the answer is yes, the final worst case discharge planning volume equals the total aboveground oil storage capacity at the facility.

(1) FINAL WORST CASE VOLUME: ____ GAL

(2) Do not proceed further.

A.2.2 If the answer is no, calculate the total aboveground oil storage capacity of tanks without adequate secondary containment. If all aboveground oil storage tanks or groups of aboveground oil storage tanks at the facility have adequate secondary containment, ENTER “0” (zero).

____ GAL

A.2.3 Calculate the capacity of the largest single aboveground oil storage tank within an adequate secondary containment area or the combined capacity of a group of aboveground oil storage tanks permanently manifolded together, whichever is greater, PLUS THE VOLUME FROM QUESTION A.2.2.

FINAL WORST CASE VOLUME: 3 ____ GAL

3 All complexes that are jointly regulated by EPA and the USCG must also calculate the worst case discharge planning volume for the transportation-related portions of the facility and plan for whichever volume is greater.

PART B: WORST CASE DISCHARGE PLANNING VOLUME CALCULATION FOR ONSHORE PRODUCTION FACILITIES

Part B of this worksheet is to be completed by the owner or operator of an SPCC-regulated oil production facility if the facility meets the criteria presented in Appendix C to this part, or if it is determined by the RA that the facility could cause substantial harm. A production facility consists of all wells (producing and exploratory) and related equipment in a single geographical oil or gas field operated by a single operator.

B.1 SINGLE-TANK FACILITIES

B.1.1 For facilities containing only one aboveground oil storage tank, the worst case discharge planning volume equals the capacity of the aboveground oil storage tank plus the production volume of the well with the highest output at the facility. If adequate secondary containment (sufficiently large to contain the capacity of the aboveground oil storage tank plus sufficient freeboard to allow for precipitation) exists for the storage tank, multiply the capacity of the tank by 0.8.

B.1.2 For facilities with production wells producing by pumping, if the rate of the well with the highest output is known and the number of days the facility is unattended can be predicted, then the production volume is equal to the pumping rate of the well multiplied by the greatest number of days the facility is unattended.

B.1.3 If the pumping rate of the well with the highest output is estimated or the maximum number of days the facility is unattended is estimated, then the production volume is determined from the pumping rate of the well multiplied by 1.5 times the greatest number of days that the facility has been or is expected to be unattended.

B.1.4 Attachment D–1 to this appendix provides methods for calculating the production volume for exploratory wells and production wells producing under pressure.

(1) FINAL WORST CASE VOLUME: ____ GAL

(2) Do not proceed further.

B.2 SECONDARY CONTAINMENT—MULTIPLE-TANK FACILITIES

Are all aboveground oil storage tanks or groups of aboveground oil storage tanks at the facility without adequate secondary containment?
___ (Y/N)
B.2.1 If the answer is yes, the final worst case volume equals the total aboveground oil storage capacity without adequate secondary containment plus the production volume of the well with the highest output at the facility.
(1) For facilities with production wells producing by pumping, if the rate of the well with the highest output is known and the number of days the facility is unattended can be predicted, then the production volume is equal to the pumping rate of the well multiplied by the greatest number of days the facility is unattended.
(2) If the pumping rate of the well with the highest output is estimated or the maximum number of days the facility is unattended is estimated, then the production volume is determined from the pumping rate of the well multiplied by 1.5 times the greatest number of days that the facility has been or is expected to be unattended.
(3) Attachment D–1 to this appendix provides methods for calculating the production volumes for exploratory wells and production wells producing under pressure.
(A) FINAL WORST CASE VOLUME: ____ GAL
(B) Do not proceed further.
B.2.2 If the answer is no, calculate the total aboveground oil storage capacity of tanks without adequate secondary containment. If all aboveground oil storage tanks or groups of aboveground oil storage tanks at the facility have adequate secondary containment, ENTER “0” (zero).
____ GAL
B.2.3 Calculate the capacity of the largest single aboveground oil storage tank within an adequate secondary containment area or the combined capacity of a group of aboveground oil storage tanks permanently manifolded together, whichever is greater, plus the production volume of the well with the highest output, PLUS THE VOLUME FROM QUESTION B.2.2. Attachment D–1 provides methods for calculating the production volumes for exploratory wells and production wells producing under pressure.
(1) FINAL WORST CASE VOLUME: 4 ____ GAL
4 All complexes that are jointly regulated by EPA and the USCG must also calculate the worst case discharge planning volume for the transportation-related portions of the facility and plan for whichever volume is greater.
(2) Do not proceed further.
Attachments to Appendix D
Attachment D–I—Methods To Calculate Production Volumes for Production Facilities With Exploratory Wells or Production Wells Producing Under Pressure
1.0 Introduction
The owner or operator of a production facility with exploratory wells or production wells producing under pressure shall compare the well rate of the highest output well (rate of well), in barrels per day, to the ability of response equipment and personnel to recover the volume of oil that could be discharged (rate of recovery), in barrels per day. The result of this comparison will determine the method used to calculate the production

volume for the production facility. This production volume is to be used to calculate the worst case discharge planning volume in part B of this appendix.

2.0 Description of Methods

2.1 Method A

If the well rate would overwhelm the response efforts (i.e., rate of well/rate of recovery ≥1), then the production volume would be the 30-day forecasted well rate for a well 10,000 feet deep or less, or the 45-day forecasted well rate for a well deeper than 10,000 feet.

(1) For wells 10,000 feet deep or less:

Production volume=30 days × rate of well.

(2) For wells deeper than 10,000 feet:

Production volume=45 days × rate of well.

2.2 Method B

2.2.1 If the rate of recovery would be greater than the well rate (i.e., rate of well/rate of recovery <1), then the production volume would equal the sum of two terms:

Production volume=discharge volume1 + discharge volume2

2.2.2 The first term represents the volume of the oil discharged from the well between the time of the blowout and the time the response resources are on scene and recovering oil (discharge volume1).

Discharge volume1=(days unattended+days to respond) × (rate of well)

2.2.3 The second term represents the volume of oil discharged from the well after the response resources begin operating until the discharge is stopped, adjusted for the recovery rate of the response resources (discharge volume2).

(1) For wells 10,000 feet deep or less:

Discharge volume2=[30 days−(days unattended + days to respond)] × (rate of well) × (rate of well/rate of recovery)

(2) For wells deeper than 10,000 feet:

Discharge volume2=[45 days−(days unattended + days to respond)] × (rate of well) × (rate of well/rate of recovery)

3.0 Example

3.1 A facility consists of two production wells producing under pressure, which are both less than 10,000 feet deep. The well rate of well A is 5 barrels per day, and the well rate of well B is 10 barrels per day. The facility is unattended for a maximum of 7 days. The facility operator estimates that it will take 2 days to have response equipment and personnel on scene and responding to a blowout, and that the projected rate of recovery will be 20 barrels per day.

(1) First, the facility operator determines that the highest output well is well B. The facility operator calculates the ratio of the rate of well to the rate of recovery:

10 barrels per day/20 barrels per day=0.5 Because the ratio is less than one, the facility operator will use Method B to calculate the production volume.

(2) The first term of the equation is:

Discharge volume1=(7 days + 2 days) × (10 barrels per day)=90 barrels

(3) The second term of the equation is:

Discharge volume2=[30 days—(7 days + 2 days)] × (10 barrels per day) × (0.5)=105 barrels

(4) Therefore, the production volume is:
Production volume=90 barrels + 105 barrels=195 barrels
3.2 If the recovery rate was 5 barrels per day, the ratio of rate of well to rate of recovery would be 2, so the facility operator would use Method A. The production volume would have been:
30 days × 10 barrels per day=300 barrels
[59 FR 34110, July 1, 1994; 59 FR 49006, Sept. 26, 1994, as amended at 65 FR 40800, June 30, 2000; 67 FR 47152, July 17, 2002]

Appendix E to Part 112—Determination and Evaluation of Required Response Resources for Facility Response Plans

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1.0 Purpose and Definitions

1.1 The purpose of this appendix is to describe the procedures to identify response resources to meet the requirements of §112.20. To identify response resources to meet the facility response plan requirements of 40 CFR 112.20(h), owners or operators shall follow this appendix or, where not appropriate, shall clearly demonstrate in the response plan why use of this appendix is not appropriate at the facility and make comparable arrangements for response resources.

1.2 Definitions.

1.2.1 Animal fat means a non-petroleum oil, fat, or grease of animal, fish, or marine mammal origin. Animal fats are further classified based on specific gravity as follows:
(1) Group A—specific gravity less than 0.8.
(2) Group B—specific gravity equal to or greater than 0.8 and less than 1.0.
(3) Group C—specific gravity equal to or greater than 1.0.

1.2.2 Nearshore is an operating area defined as extending seaward 12 miles from the boundary lines defined in 46 CFR part 7, except in the Gulf of Mexico. In the Gulf of Mexico, it means the area extending 12 miles from the line of demarcation (COLREG lines) defined in 49 CFR 80.740 and 80.850.

1.2.3 Non-persistent oils or Group 1 oils include:
(1) A petroleum-based oil that, at the time of shipment, consists of hydrocarbon fractions:
(A) At least 50 percent of which by volume, distill at a temperature of 340 degrees C (645 degrees F); and
(B) At least 95 percent of which by volume, distill at a temperature of 370 degrees C (700 degrees F); and
(2) A non-petroleum oil, other than an animal fat or vegetable oil, with a specific gravity less than 0.8.

1.2.4 Non-petroleum oil means oil of any kind that is not petroleum-based, including but not limited to: fats, oils, and greases of animal, fish, or marine mammal origin; and vegetable oils, including oils from seeds, nuts, fruits, and kernels.

1.2.5 Ocean means the nearshore area.

1.2.6 Operating area means Rivers and Canals, Inland, Nearshore, and Great Lakes geographic location(s) in which a facility is handling, storing, or transporting oil.

1.2.7 Operating environment means Rivers and Canals, Inland, Great Lakes, or Ocean. These terms are used to define the conditions in which response equipment is designed to function.

1.2.8 Persistent oils include:

(1) A petroleum-based oil that does not meet the distillation criteria for a non-persistent oil. Persistent oils are further classified based on specific gravity as follows:

(A) Group 2—specific gravity less than 0.85;

(B) Group 3—specific gravity equal to or greater than 0.85 and less than 0.95;

(C) Group 4—specific gravity equal to or greater than 0.95 and less than 1.0; or

(D) Group 5—specific gravity equal to or greater than 1.0.

(2) A non-petroleum oil, other than an animal fat or vegetable oil, with a specific gravity of 0.8 or greater. These oils are further classified based on specific gravity as follows:

(A) Group 2—specific gravity equal to or greater than 0.8 and less than 0.85;

(B) Group 3—specific gravity equal to or greater than 0.85 and less than 0.95;

(C) Group 4—specific gravity equal to or greater than 0.95 and less than 1.0; or

(D) Group 5—specific gravity equal to or greater than 1.0.

1.2.9 Vegetable oil means a non-petroleum oil or fat of vegetable origin, including but not limited to oils and fats derived from plant seeds, nuts, fruits, and kernels. Vegetable oils are further classified based on specific gravity as follows:

(1) Group A—specific gravity less than 0.8.

(2) Group B—specific gravity equal to or greater than 0.8 and less than 1.0.

(3) Group C—specific gravity equal to or greater than 1.0.

1.2.10 Other definitions are included in §112.2, section 1.1 of Appendix C, and section 3.0 of Appendix F.

2.0 Equipment Operability and Readiness

2.1 All equipment identified in a response plan must be designed to operate in the conditions expected in the facility's geographic area (i.e., operating environment). These conditions vary widely based on location and season. Therefore, it is difficult to identify a single stockpile of response equipment that will function effectively in each geographic location (i.e., operating area).

2.2 Facilities handling, storing, or transporting oil in more than one operating environment as indicated in Table 1 of this appendix must identify equipment capable of successfully functioning in each operating environment.

2.3 When identifying equipment for the response plan (based on the use of this appendix), a facility owner or operator must consider the inherent limitations of the operability of equipment components and response systems. The criteria in Table 1 of this appendix shall be used to evaluate the operability in a given environment. These criteria reflect the general conditions in certain operating environments.

2.3.1 The Regional Administrator may require documentation that the boom identified in a facility response plan meets the criteria in Table 1 of this appendix. Absent acceptable documentation, the Regional Administrator may require that the boom be tested to demonstrate that it meets the criteria in Table 1 of this appendix. Testing must be in accordance with ASTM F 715, ASTM F 989, or other tests approved by EPA as deemed appropriate (see Appendix E to this part, section 13, for general availability of documents).

2.4 Table 1 of this appendix lists criteria for oil recovery devices and boom. All other equipment necessary to sustain or support response operations in an operating environment must be designed to function in the same conditions. For example, boats that deploy or support skimmers or boom must be capable of being safely operated in the significant wave heights listed for the applicable operating environment.

2.5 A facility owner or operator shall refer to the applicable Area Contingency Plan (ACP), where available, to determine if ice, debris, and weather-related visibility are significant factors to evaluate the operability of equipment. The ACP may also identify the average temperature ranges expected in the facility's operating area. All equipment identified in a response plan must be designed to operate within those conditions or ranges.

2.6 This appendix provides information on response resource mobilization and response times. The distance of the facility from the storage location of the response resources must be used to determine whether the resources can arrive on-scene within the stated time. A facility owner or operator shall include the time for notification, mobilization, and travel of resources identified to meet the medium and Tier 1 worst case discharge requirements identified in sections 4.3 and 9.3 of this appendix (for medium discharges) and section 5.3 of this appendix (for worst case discharges). The facility owner or operator must plan for notification and mobilization of Tier 2 and 3 response resources as necessary to meet the requirements for arrival on-scene in accordance with section 5.3 of this appendix. An on-water speed of 5 knots and a land speed of 35 miles per hour is assumed, unless the facility owner or operator can demonstrate otherwise.

2.7 In identifying equipment, the facility owner or operator shall list the storage location, quantity, and manufacturer's make and model. For oil recovery devices, the effective daily recovery capacity, as determined using section 6 of this appendix, must be included. For boom, the overall boom height (draft and freeboard) shall be included. A facility owner or operator is responsible for ensuring that the identified boom has compatible connectors.

3.0 Determining Response Resources Required for Small Discharges—Petroleum Oils and Non-Petroleum Oils Other Than Animal Fats and Vegetable Oils

3.1 A facility owner or operator shall identify sufficient response resources available, by contract or other approved means as described in §112.2, to respond to a small discharge. A small discharge is defined as any discharge volume less than or equal to 2,100 gallons, but not to exceed the calculated worst case discharge. The equipment must be designed to function in the operating environment at the point of expected use.

3.2 Complexes that are regulated by EPA and the United States Coast Guard (USCG) must also consider planning quantities for the transportation-related transfer portion of the facility.

3.2.1 Petroleum oils. The USCG planning level that corresponds to EPA's "small discharge" is termed "the average most probable discharge." A USCG rule found at 33 CFR 154.1020 defines "the average most probable discharge" as the lesser of 50 barrels (2,100 gallons) or 1 percent of the volume of the worst case discharge. Owners or operators of complexes that handle, store, or transport petroleum oils must compare oil discharge volumes for a small discharge and an average most probable discharge, and plan for whichever quantity is greater.

3.2.2 Non-petroleum oils other than animal fats and vegetable oils. Owners or operators of complexes that handle, store, or transport non-petroleum oils other than animal fats and vegetable oils must plan for oil discharge volumes for a small discharge. There is no USCG planning level that directly corresponds to EPA's "small discharge." However, the USCG (at 33 CFR 154.545) has requirements to identify equipment to contain oil resulting from an operational discharge.

3.3 The response resources shall, as appropriate, include:

3.3.1 One thousand feet of containment boom (or, for complexes with marine transfer components, 1,000 feet of containment boom or two times the length of the largest vessel that regularly conducts oil transfers to or from the facility, whichever is greater), and a means of deploying it within 1 hour of the discovery of a discharge;

3.3.2 Oil recovery devices with an effective daily recovery capacity equal to the amount of oil discharged in a small discharge or greater which is available at the facility within 2 hours of the detection of an oil discharge; and

3.3.3 Oil storage capacity for recovered oily material indicated in section 12.2 of this appendix.

4.0 Determining Response Resources Required for Medium Discharges—Petroleum Oils and Non-Petroleum Oils Other Than Animal Fats and Vegetable Oils

4.1 A facility owner or operator shall identify sufficient response resources available, by contract or other approved means as described in §112.2, to respond to a medium discharge of oil for that facility. This will require response resources capable of containing and collecting up to 36,000 gallons of oil or 10 percent of the worst case discharge, whichever is less. All equipment identified must be designed to operate in the applicable operating environment specified in Table 1 of this appendix.

4.2 Complexes that are regulated by EPA and the USCG must also consider planning quantities for the transportation-related transfer portion of the facility.

4.2.1 Petroleum oils. The USCG planning level that corresponds to EPA's "medium discharge" is termed "the maximum most probable discharge." The USCG rule found at 33 CFR part 154 defines "the maximum most probable discharge" as a discharge of 1,200 barrels (50,400 gallons) or 10 percent of the worst case discharge, whichever is less. Owners or operators of complexes that handle, store, or transport petroleum oils must compare calculated discharge volumes for a medium discharge and a maximum most probable discharge, and plan for whichever quantity is greater.

4.2.2 Non-petroleum oils other than animal fats and vegetable oils. Owners or operators of complexes that handle, store, or transport non-petroleum oils other than animal fats and vegetable oils must plan for oil discharge volumes for a medium discharge. For non-petroleum oils, there is no USCG planning level that directly corresponds to EPA's “medium discharge.”

4.3 Oil recovery devices identified to meet the applicable medium discharge volume planning criteria must be located such that they are capable of arriving on-scene within 6 hours in higher volume port areas and the Great Lakes and within 12 hours in all other areas. Higher volume port areas and Great Lakes areas are defined in section 1.1 of Appendix C to this part.

4.4 Because rapid control, containment, and removal of oil are critical to reduce discharge impact, the owner or operator must determine response resources using an effective daily recovery capacity for oil recovery devices equal to 50 percent of the planning volume applicable for the facility as determined in section 4.1 of this appendix. The effective daily recovery capacity for oil recovery devices identified in the plan must be determined using the criteria in section 6 of this appendix.

4.5 In addition to oil recovery capacity, the plan shall, as appropriate, identify sufficient quantity of containment boom available, by contract or other approved means as described in §112.2, to arrive within the required response times for oil collection and containment and for protection of fish and wildlife and sensitive environments. For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's “Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments” (see Appendix E to this part, section 13, for availability) and the applicable ACP. Although 40 CFR part 112 does not set required quantities of boom for oil collection and containment, the response plan shall identify and ensure, by contract or other approved means as described in §112.2, the availability of the quantity of boom identified in the plan for this purpose.

4.6 The plan must indicate the availability of temporary storage capacity to meet section 12.2 of this appendix. If available storage capacity is insufficient to meet this level, then the effective daily recovery capacity must be derated (downgraded) to the limits of the available storage capacity.

4.7 The following is an example of a medium discharge volume planning calculation for equipment identification in a higher volume port area: The facility's largest aboveground storage tank volume is 840,000 gallons. Ten percent of this capacity is 84,000 gallons. Because 10 percent of the facility's largest tank, or 84,000 gallons, is greater than 36,000 gallons, 36,000 gallons is used as the planning volume. The effective daily recovery capacity is 50 percent of the planning volume, or 18,000 gallons per day. The ability of oil recovery devices to meet this capacity must be calculated using the procedures in section 6 of this appendix. Temporary storage capacity available on-scene must equal twice the daily recovery capacity as indicated in section 12.2 of this appendix, or 36,000 gallons per day. This is the information the facility owner or operator must use to identify and ensure the availability of the required response resources, by contract or other approved means as described in §112.2. The facility owner shall also identify how much boom is available for use.

5.0 Determining Response Resources Required for the Worst Case Discharge to the Maximum Extent Practicable

5.1 A facility owner or operator shall identify and ensure the availability of, by contract or other approved means as described in §112.2, sufficient response resources to respond to the worst case discharge of oil to the maximum extent practicable. Sections 7 and 10 of this appendix describe the method to determine the necessary response resources. Worksheets are provided as Attachments E–1 and E–2 at the end of this appendix to simplify the procedures involved in calculating the planning volume for response resources for the worst case discharge.

5.1 A facility owner or operator shall identify and ensure the availability of, by contract or other approved means as described in §112.2, sufficient response resources to respond to the worst case discharge of oil to the maximum extent practicable. Sections 7 and 10 of this appendix describe the method to determine the necessary response resources. Worksheets are provided as Attachments E–1 and E–2 at the end of this appendix to simplify the procedures involved in calculating the planning volume for response resources for the worst case discharge.

5.2 Complexes that are regulated by EPA and the USCG must also consider planning for the worst case discharge at the transportation-related portion of the facility. The USCG requires that transportation-related facility owners or operators use a different calculation for the worst case discharge in the revisions to 33 CFR part 154. Owners or operators of complex facilities that are regulated by EPA and the USCG must compare both calculations of worst case discharge derived by EPA and the USCG and plan for whichever volume is greater.

5.3 Oil discharge response resources identified in the response plan and available, by contract or other approved means as described in §112.2, to meet the applicable worst case discharge planning volume must be located such that they are capable of arriving at the scene of a discharge within the times specified for the applicable response tier listed as follows

	Tier 1 (in hours)	Tier 2 (in hours)	Tier 3 (in hours)
Higher volume port areas..	6	30	54
Great Lakes..	12	36	60
All other river and canal, inland, and nearshore areas..................	12	36	60

The three levels of response tiers apply to the amount of time in which facility owners or operators must plan for response resources to arrive at the scene of a discharge to respond to the worst case discharge planning volume. For example, at a worst case discharge in an inland area, the first tier of response resources (i.e., that amount of on-water and shoreline cleanup capacity necessary to respond to the fraction of the worst case discharge as indicated through the series of steps described in sections 7.2 and 7.3 or sections 10.2 and 10.3 of this appendix) would arrive at the scene of the discharge within 12 hours; the second tier of response resources would arrive within 36 hours; and the third tier of response resources would arrive within 60 hours.

5.4 The effective daily recovery capacity for oil recovery devices identified in the response plan must be determined using the criteria in section 6 of this appendix. A facility owner or operator shall identify the storage locations of all response resources used for each tier. The owner or operator of a facility whose required daily recovery capacity exceeds the applicable contracting caps in Table 5 of this appendix shall, as appropriate, identify sources of additional equipment, their location, and the arrangements made to obtain this equipment during a response. The owner or operator of a facility whose calculated planning volume exceeds the applicable contracting caps in Table 5 of this appendix shall, as appropriate, identify sources of additional equipment equal to twice the cap listed in Tier 3 or the amount necessary to reach the calculated planning volume, whichever is lower. The resources identified above the cap shall be capable of arriving on-scene not later than the Tier 3 response times in section 5.3 of this appendix. No contract is required. While general listings of available response equipment may be used to identify additional sources (i.e., “public” resources vs. “private” resources), the response plan shall identify the specific sources, locations, and quantities of equipment that a facility owner or operator has considered in his or her planning. When listing USCG-classified oil spill removal organization(s) that have sufficient removal capacity to recover the volume above the response capacity cap for the specific facility, as specified in Table 5 of this appendix, it is not necessary to list specific quantities of equipment.

5.5 A facility owner or operator shall identify the availability of temporary storage capacity to meet section 12.2 of this appendix. If available storage capacity is insufficient, then the effective daily recovery capacity must be derated (downgraded) to the limits of the available storage capacity.

5.6 When selecting response resources necessary to meet the response plan requirements, the facility owner or operator shall, as appropriate, ensure that a portion of those resources is capable of being used in close-to-shore response activities in shallow water. For any EPA-regulated facility that is required to plan for response in shallow water, at least 20 percent of the on-water response equipment identified for the applicable operating area shall, as appropriate, be capable of operating in water of 6 feet or less depth.

5.7 In addition to oil spill recovery devices, a facility owner or operator shall identify sufficient quantities of boom that are available, by contract or other approved means as described in §112.2, to arrive on-scene within the specified response times for oil containment and collection. The specific quantity of boom required for collection and containment will depend on the facility-specific information and response strategies employed. A facility owner or operator shall, as appropriate, also identify sufficient quantities of oil containment boom to protect fish and wildlife and sensitive environments. For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's “Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments” (see Appendix E to this part, section 13, for availability), and the applicable ACP. Refer to this guidance document for the number of days and geographic areas (i.e., operating environments) specified in Table 2 and Table 6 of this appendix.

5.8 A facility owner or operator shall also identify, by contract or other approved means as described in §112.2, the availability of an oil spill removal organization(s) (as described in §112.2) capable of responding to a shoreline cleanup operation involving the calculated volume of oil and emulsified oil that might impact the affected shoreline. The volume of oil that shall, as appropriate, be planned for is calculated through the application of factors contained in Tables 2, 3, 6, and 7 of this appendix. The volume calculated from these tables is intended to assist the facility owner or operator to identify an oil spill removal organization with sufficient resources and expertise.

6.0 Determining Effective Daily Recovery Capacity for Oil Recovery Devices

6.1 Oil recovery devices identified by a facility owner or operator must be identified by the manufacturer, model, and effective daily recovery capacity. These capacities must be used to determine whether there is sufficient capacity to meet the applicable planning criteria for a small discharge, a medium discharge, and a worst case discharge to the maximum extent practicable.

6.2 To determine the effective daily recovery capacity of oil recovery devices, the formula listed in section 6.2.1 of this appendix shall be used. This formula considers potential limitations due to available daylight, weather, sea state, and percentage of emulsified oil in the recovered material. The RA may assign a lower efficiency factor to equipment listed in a response plan if it is determined that such a reduction is warranted.

6.2.1 The following formula shall be used to calculate the effective daily recovery capacity:

$R = T \times 24 \text{ hours} \times E$

where:

R—Effective daily recovery capacity;

T—Throughput rate in barrels per hour (nameplate capacity); and

E—20 percent efficiency factor (or lower factor as determined by the Regional Administrator).

6.2.2 For those devices in which the pump limits the throughput of liquid, throughput rate shall be calculated using the pump capacity.

6.2.3 For belt or moptype devices, the throughput rate shall be calculated using the speed of the belt or mop through the device, assumed thickness of oil adhering to or collected by the device, and surface area of the belt or mop. For purposes of this calculation, the assumed thickness of oil will be 1/4 inch.

6.2.4 Facility owners or operators that include oil recovery devices whose throughput is not measurable using a pump capacity or belt/mop speed may provide information to support an alternative method of calculation. This information must be submitted following the procedures in section 6.3.2 of this appendix.

6.3 As an alternative to section 6.2 of this appendix, a facility owner or operator may submit adequate evidence that a different effective daily recovery capacity should be applied for a specific oil recovery device. Adequate evidence is actual verified performance data in discharge conditions or tests using American Society of Testing and Materials (ASTM) Standard F 631–99, F 808–83 (1999), or an equivalent test approved by EPA as deemed appropriate (see Appendix E to this part, section 13, for general availability of documents).

6.3.1 The following formula must be used to calculate the effective daily recovery capacity under this alternative:

$R = D \times U$

where:

R—Effective daily recovery capacity;

D—Average Oil Recovery Rate in barrels per hour (Item 26 in F 808–83; Item 13.2.16 in F 631–99; or actual performance data); and

U—Hours per day that equipment can operate under discharge conditions. Ten hours per day must be used unless a facility owner or operator can demonstrate that the recovery operation can be sustained for longer periods.

6.3.2 A facility owner or operator submitting a response plan shall provide data that supports the effective daily recovery capacities for the oil recovery devices listed. The following is an example of these calculations:

(1) A weir skimmer identified in a response plan has a manufacturer's rated throughput at the pump of 267 gallons per minute (gpm).

267 gpm=381 barrels per hour (bph)

R=381 bph×24 hr/day×0.2=1,829 barrels per day

(2) After testing using ASTM procedures, the skimmer's oil recovery rate is determined to be 220 gpm. The facility owner or operator identifies sufficient resources available to support operations for 12 hours per day.

220 gpm=314 bph

R=314 bph×12 hr/day=3,768 barrels per day

(3) The facility owner or operator will be able to use the higher capacity if sufficient temporary oil storage capacity is available. Determination of alternative efficiency factors under section 6.2 of this appendix or the acceptability of an alternative effective daily recovery capacity under section 6.3 of this appendix will be made by the Regional Administrator as deemed appropriate.

7.0 Calculating Planning Volumes for a Worst Case Discharge—Petroleum Oils and Non-Petroleum Oils Other Than Animal Fats and Vegetable Oils

7.1 A facility owner or operator shall plan for a response to the facility's worst case discharge. The planning for on-water oil recovery must take into account a loss of some oil to the environment due to evaporative and natural dissipation, potential increases in volume due to emulsification, and the potential for deposition of oil on the shoreline. The procedures for non-petroleum oils other than animal fats and vegetable oils are discussed in section 7.7 of this appendix.

7.2 The following procedures must be used by a facility owner or operator in determining the required on-water oil recovery capacity:

7.2.1 The following must be determined: the worst case discharge volume of oil in the facility; the appropriate group(s) for the types of oil handled, stored, or transported at the facility [persistent (Groups 2, 3, 4, 5) or non-persistent (Group 1)]; and the facility's specific operating area. See sections 1.2.3 and 1.2.8 of this appendix for the definitions of non-persistent and persistent oils, respectively. Facilities that handle, store, or transport oil from different oil groups must calculate each group separately, unless the oil group constitutes 10 percent or less by volume of the facility's total oil storage capacity. This information is to be used with Table 2 of this appendix to determine the percentages of the total volume to be used for removal capacity planning. Table 2 of this appendix divides the volume into three categories: oil lost to the environment; oil deposited on the shoreline; and oil available for on-water recovery.

7.2.2 The on-water oil recovery volume shall, as appropriate, be adjusted using the appropriate emulsification factor found in Table 3 of this appendix. Facilities that handle, store, or transport oil from different petroleum groups must compare the on-water recovery volume for each oil group (unless the oil group constitutes 10 percent or less by volume of the facility's total storage capacity) and use the calculation that results in the largest on-water oil recovery volume to plan for the amount of response resources for a worst case discharge.

7.2.3 The adjusted volume is multiplied by the on-water oil recovery resource mobilization factor found in Table 4 of this appendix from the appropriate operating area and response tier to determine the total on-water oil recovery capacity in barrels per day that must be identified or contracted to arrive on-scene within the applicable time for each response tier. Three tiers are specified. For higher volume port areas, the contracted tiers of resources must be located such that they are capable of arriving on-scene within 6 hours for Tier 1, 30 hours for Tier 2, and 54 hours for Tier 3 of the discovery of an oil discharge. For all other rivers and canals, inland, nearshore areas, and the Great Lakes, these tiers are 12, 36, and 60 hours.

7.2.4 The resulting on-water oil recovery capacity in barrels per day for each tier is used to identify response resources necessary to sustain operations in the applicable operating area. The equipment shall be capable of sustaining operations for the time period specified in Table 2 of this appendix. The facility owner or operator shall identify and ensure the availability, by contract or other approved means as described in §112.2, of sufficient oil spill recovery devices to provide the effective daily oil recovery capacity required. If the required capacity exceeds the applicable cap specified in Table 5 of this appendix, then a facility owner or operator shall ensure, by contract or other approved means as described in §112.2, only for the quantity of resources required to meet the cap, but shall identify sources of additional resources as indicated in section 5.4 of this appendix. The owner or operator of a facility whose planning volume exceeded the cap in 1993 must make arrangements to identify and ensure the availability, by contract or other approved means as described in §112.2, for additional capacity to be under contract by 1998 or 2003, as appropriate. For a facility that handles multiple groups of oil, the required effective daily recovery capacity for each oil group is calculated before applying the cap. The oil group calculation resulting in the largest on-water recovery volume must be used to plan for the amount of response resources for a worst case discharge, unless the oil group comprises 10 percent or less by volume of the facility's total oil storage capacity.

7.3 The procedures discussed in sections 7.3.1–7.3.3 of this appendix must be used to calculate the planning volume for identifying shoreline cleanup capacity (for Group 1 through Group 4 oils).

7.3.1 The following must be determined: the worst case discharge volume of oil for the facility; the appropriate group(s) for the types of oil handled, stored, or transported at the facility [persistent (Groups 2, 3, or 4) or non-persistent (Group 1)]; and the geographic area(s) in which the facility operates (i.e., operating areas). For a facility handling, storing, or transporting oil from different groups, each group must be calculated separately. Using this information, Table 2 of this appendix must be used to determine the percentages of the total volume to be used for shoreline cleanup resource planning.

7.3.2 The shoreline cleanup planning volume must be adjusted to reflect an emulsification factor using the same procedure as described in section 7.2.2 of this appendix.

7.3.3 The resulting volume shall be used to identify an oil spill removal organization with the appropriate shoreline cleanup capability.

7.4 A response plan must identify response resources with fire fighting capability. The owner or operator of a facility that handles, stores, or transports Group 1 through Group 4 oils that does not have adequate fire fighting resources located at the facility or that cannot rely on sufficient local fire fighting resources must identify adequate fire fighting resources. The facility owner or operator shall ensure, by contract or other approved means as described in §112.2, the availability of these resources. The response plan must also identify an individual located at the facility to work with the fire department for Group 1 through Group 4 oil fires. This individual shall also verify that sufficient well-trained fire fighting resources are available within a reasonable response time to a worst case scenario. The individual may be the qualified individual identified in the response plan or another appropriate individual located at the facility.

7.5 The following is an example of the procedure described above in sections 7.2 and 7.3 of this appendix: A facility with a 270,000 barrel (11.3 million gallons) capacity for #6 oil (specific gravity 0.96) is located in a higher volume port area. The facility is on a peninsula and has docks on both the ocean and bay sides. The facility has four aboveground oil storage tanks with a combined total capacity of 80,000 barrels (3.36 million gallons) and no secondary containment. The remaining facility tanks are inside secondary containment structures. The largest aboveground oil storage tank (90,000 barrels or 3.78 million gallons) has its own secondary containment. Two 50,000 barrel (2.1 million gallon) tanks (that are not connected by a manifold) are within a common secondary containment tank area, which is capable of holding 100,000 barrels (4.2 million gallons) plus sufficient freeboard.

7.5.1 The worst case discharge for the facility is calculated by adding the capacity of all aboveground oil storage tanks without secondary containment (80,000 barrels) plus the capacity of the largest aboveground oil storage tank inside secondary containment. The resulting worst case discharge volume is 170,000 barrels or 7.14 million gallons.

7.5.2 Because the requirements for Tiers 1, 2, and 3 for inland and nearshore exceed the caps identified in Table 5 of this appendix, the facility owner will contract for a response to 10,000 barrels per day (bpd) for Tier 1, 20,000 bpd for Tier 2, and 40,000 bpd for Tier 3. Resources for the remaining 7,850 bpd for Tier 1, 9,750 bpd for Tier 2, and 7,600 bpd for Tier 3 shall be identified but need not be contracted for in advance. The facility owner or operator shall, as appropriate, also identify or contract for quantities of boom identified in their response plan for the protection of fish and wildlife and sensitive environments within the area potentially impacted by a worst case discharge from the facility. For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's “Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments,” (see Appendix E to this part, section 13, for availability) and the applicable ACP. Attachment C–III to Appendix C provides a method for calculating a planning distance to fish and wildlife and sensitive environments and public drinking water intakes that may be impacted in the event of a worst case discharge.

7.6 The procedures discussed in sections 7.6.1–7.6.3 of this appendix must be used to determine appropriate response resources for facilities with Group 5 oils.

7.6.1 The owner or operator of a facility that handles, stores, or transports Group 5 oils shall, as appropriate, identify the response resources available by contract or other approved means, as described in §112.2. The equipment identified in a response plan shall, as appropriate, include:

(1) Sonar, sampling equipment, or other methods for locating the oil on the bottom or suspended in the water column;

(2) Containment boom, sorbent boom, silt curtains, or other methods for containing the oil that may remain floating on the surface or to reduce spreading on the bottom;

(3) Dredges, pumps, or other equipment necessary to recover oil from the bottom and shoreline;

(4) Equipment necessary to assess the impact of such discharges; and

(5) Other appropriate equipment necessary to respond to a discharge involving the type of oil handled, stored,, or transported.

7.6.2 Response resources identified in a response plan for a facility that handles, stores, or transports Group 5 oils under section 7.6.1 of this appendix shall be capable of being deployed (on site) within 24 hours of discovery of a discharge to the area where the facility is operating.

7.6.3 A response plan must identify response resources with fire fighting capability. The owner or operator of a facility that handles, stores, or transports Group 5 oils that does not have adequate fire fighting resources located at the facility or that cannot rely on sufficient local fire fighting resources must identify adequate fire fighting resources. The facility owner or operator shall ensure, by contract or other approved means as described in §112.2, the availability of these resources. The response plan shall also identify an individual located at the facility to work with the fire department for Group 5 oil fires. This individual shall also verify that sufficient well-trained fire fighting resources are available within a reasonable response time to respond to a worst case discharge. The individual may be the qualified individual identified in the response plan or another appropriate individual located at the facility.

7.7 Non-petroleum oils other than animal fats and vegetable oils. The procedures described in sections 7.7.1 through 7.7.5 of this appendix must be used to determine appropriate response plan development and evaluation criteria for facilities that handle, store, or transport non-petroleum oils other than animal fats and vegetable oils. Refer to section 11 of this appendix for information on the limitations on the use of chemical agents for inland and nearshore areas.

7.7.1 An owner or operator of a facility that handles, stores, or transports non-petroleum oils other than animal fats and vegetable oils must provide information in his or her plan that identifies:

(1) Procedures and strategies for responding to a worst case discharge to the maximum extent practicable; and

(2) Sources of the equipment and supplies necessary to locate, recover, and mitigate such a discharge.

7.7.2 An owner or operator of a facility that handles, stores, or transports non-petroleum oils other than animal fats and vegetable oils must ensure that any equipment identified in a response plan is capable of operating in the conditions expected in the geographic area(s) (i.e., operating environments) in which the facility operates using the criteria in Table 1 of this appendix. When evaluating the operability of equipment, the facility owner or operator must consider limitations that are identified in the appropriate ACPs, including:

(1) Ice conditions;

(2) Debris;

(3) Temperature ranges; and

(4) Weather-related visibility.

7.7.3 The owner or operator of a facility that handles, stores, or transports non-petroleum oils other than animal fats and vegetable oils must identify the response resources that are available by contract or other approved means, as described in §112.2. The equipment described in the response plan shall, as appropriate, include:

(1) Containment boom, sorbent boom, or other methods for containing oil floating on the surface or to protect shorelines from impact;

(2) Oil recovery devices appropriate for the type of non-petroleum oil carried; and

(3) Other appropriate equipment necessary to respond to a discharge involving the type of oil carried.

7.7.4 Response resources identified in a response plan according to section 7.7.3 of this appendix must be capable of commencing an effective on-scene response within the applicable tier response times in section 5.3 of this appendix.

7.7.5 A response plan must identify response resources with fire fighting capability. The owner or operator of a facility that handles, stores, or transports non-petroleum oils other than animal fats and vegetable oils that does not have adequate fire fighting resources located at the facility or that cannot rely on sufficient local fire fighting resources must identify adequate fire fighting resources. The owner or operator shall ensure, by contract or other approved means as described in §112.2, the availability of these resources. The response plan must also identify an individual located at the facility to work with the fire department for fires of these oils. This individual shall also verify that sufficient well-trained fire fighting resources are available within a reasonable response time to a worst case scenario. The individual may be the qualified individual identified in the response plan or another appropriate individual located at the facility.

8.0 Determining Response Resources Required for Small Discharges—Animal Fats and Vegetable Oils

8.1 A facility owner or operator shall identify sufficient response resources available, by contract or other approved means as described in §112.2, to respond to a small discharge of animal fats or vegetable oils. A small discharge is defined as any discharge volume less than or equal to 2,100 gallons, but not to exceed the calculated worst case discharge. The equipment must be designed to function in the operating environment at the point of expected use.

8.2 Complexes that are regulated by EPA and the USCG must also consider planning quantities for the marine transportation-related portion of the facility.

8.2.1 The USCG planning level that corresponds to EPA's “small discharge” is termed “the average most probable discharge.” A USCG rule found at 33 CFR 154.1020 defines “the average most probable discharge” as the lesser of 50 barrels (2,100 gallons) or 1 percent of the volume of the worst case discharge. Owners or operators of complexes that handle, store, or transport animal fats and vegetable oils must compare oil discharge volumes for a small discharge and an average most probable discharge, and plan for whichever quantity is greater.

8.3 The response resources shall, as appropriate, include:

8.3.1 One thousand feet of containment boom (or, for complexes with marine transfer components, 1,000 feet of containment boom or two times the length of the largest vessel that regularly conducts oil transfers to or from the facility, whichever is greater), and a means of deploying it within 1 hour of the discovery of a discharge;

8.3.2 Oil recovery devices with an effective daily recovery capacity equal to the amount of oil discharged in a small discharge or greater which is available at the facility within 2 hours of the detection of a discharge; and

8.3.3 Oil storage capacity for recovered oily material indicated in section 12.2 of this appendix.

9.0 Determining Response Resources Required for Medium Discharges—Animal Fats and Vegetable Oils

9.1 A facility owner or operator shall identify sufficient response resources available, by contract or other approved means as described in §112.2, to respond to a medium discharge of animal fats or vegetable oils for that facility. This will require response resources capable of containing and collecting up to 36,000 gallons of oil or 10 percent of the worst case discharge, whichever is less. All equipment identified must be designed to operate in the applicable operating environment specified in Table 1 of this appendix.

9.2 Complexes that are regulated by EPA and the USCG must also consider planning quantities for the transportation-related transfer portion of the facility. Owners or operators of complexes that handle, store, or transport animal fats or vegetable oils must plan for oil discharge volumes for a medium discharge. For non-petroleum oils, there is no USCG planning level that directly corresponds to EPA's “medium discharge.” Although the USCG does not have planning requirements for medium discharges, they do have requirements (at 33 CFR 154.545) to identify equipment to contain oil resulting from an operational discharge.

9.3 Oil recovery devices identified to meet the applicable medium discharge volume planning criteria must be located such that they are capable of arriving on-scene within 6 hours in higher volume port areas and the Great Lakes and within 12 hours in all other areas. Higher volume port areas and Great Lakes areas are defined in section 1.1 of Appendix C to this part.

9.4 Because rapid control, containment, and removal of oil are critical to reduce discharge impact, the owner or operator must determine response resources using an effective daily recovery capacity for oil recovery devices equal to 50 percent of the planning volume applicable for the facility as determined in section 9.1 of this appendix. The effective daily recovery capacity for oil recovery devices identified in the plan must be determined using the criteria in section 6 of this appendix.

9.5 In addition to oil recovery capacity, the plan shall, as appropriate, identify sufficient quantity of containment boom available, by contract or other approved means as described in §112.2, to arrive within the required response times for oil collection and containment and for protection of fish and wildlife and sensitive environments. For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's “Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments” (59 FR 14713–22, March 29, 1994) and the applicable ACP. Although 40 CFR part 112 does not set required quantities of boom for oil collection and containment, the response plan shall identify and ensure, by contract or other approved means as described in §112.2, the availability of the quantity of boom identified in the plan for this purpose.

9.6 The plan must indicate the availability of temporary storage capacity to meet section 12.2 of this appendix. If available storage capacity is insufficient to meet this level, then the effective daily recovery capacity must be derated (downgraded) to the limits of the available storage capacity.

9.7 The following is an example of a medium discharge volume planning calculation for equipment identification in a higher volume port area:
The facility's largest aboveground storage tank volume is 840,000 gallons. Ten percent of this capacity is 84,000 gallons. Because 10 percent of the facility's largest tank, or 84,000 gallons, is greater than 36,000 gallons, 36,000 gallons is used as the planning volume. The effective daily recovery capacity is 50 percent of the planning volume, or 18,000 gallons per day. The ability of oil recovery devices to meet this capacity must be calculated using the procedures in section 6 of this appendix. Temporary storage capacity available on-scene must equal twice the daily recovery capacity as indicated in section 12.2 of this appendix, or 36,000 gallons per day. This is the information the facility owner or operator must use to identify and ensure the availability of the required response resources, by contract or other approved means as described in §112.2. The facility owner shall also identify how much boom is available for use.

10.0 Calculating Planning Volumes for a Worst Case Discharge—Animal Fats

and Vegetable Oils.
10.1 A facility owner or operator shall plan for a response to the facility's worst case discharge. The planning for on-water oil recovery must take into account a loss of some oil to the environment due to physical, chemical, and biological processes, potential increases in volume due to emulsification, and the potential for deposition of oil on the shoreline or on sediments. The response planning procedures for animal fats and vegetable oils are discussed in section 10.7 of this appendix. You may use alternate response planning procedures for animal fats and vegetable oils if those procedures result in environmental protection equivalent to that provided by the procedures in section 10.7 of this appendix.
10.2 The following procedures must be used by a facility owner or operator in determining the required on-water oil recovery capacity:
10.2.1 The following must be determined: the worst case discharge volume of oil in the facility; the appropriate group(s) for the types of oil handled, stored, or transported at the facility (Groups A, B, C); and the facility's specific operating area. See sections 1.2.1 and 1.2.9 of this appendix for the definitions of animal fats and vegetable oils and groups thereof. Facilities that handle, store, or transport oil from different oil groups must calculate each group separately, unless the oil group constitutes 10 percent or less by volume of the facility's total oil storage capacity. This information is to be used with Table 6 of this appendix to determine the percentages of the total volume to be used for removal capacity planning. Table 6 of this appendix divides the volume into three categories: oil lost to the environment; oil deposited on the shoreline; and oil available for on-water recovery.
10.2.2 The on-water oil recovery volume shall, as appropriate, be adjusted using the appropriate emulsification factor found in Table 7 of this appendix. Facilities that handle, store, or transport oil from different groups must compare the on-water recovery volume for each oil group (unless the oil group constitutes 10 percent or less by volume of the facility's total storage capacity) and use the calculation that results in the largest on-water oil recovery volume to plan for the amount of response resources for a worst case discharge.
10.2.3 The adjusted volume is multiplied by the on-water oil recovery resource mobilization factor found in Table 4 of this appendix from the appropriate operating area and response tier to determine the total on-water oil recovery capacity in barrels per day that must be identified or contracted to arrive on-scene within the applicable time for each response tier. Three tiers are specified. For higher volume port areas, the contracted tiers of resources must be located such that they are capable of arriving on-scene within 6 hours for Tier 1, 30 hours for Tier 2, and 54 hours for Tier 3 of the discovery of a discharge. For all other rivers and canals, inland, nearshore areas, and the Great Lakes, these tiers are 12, 36, and 60 hours.
10.2.4 The resulting on-water oil recovery capacity in barrels per day for each tier is used to identify response resources necessary to sustain operations in the applicable operating area. The equipment shall be capable of sustaining operations for the time period specified in Table 6 of this appendix. The facility owner or operator shall identify and

ensure, by contract or other approved means as described in §112.2, the availability of sufficient oil spill recovery devices to provide the effective daily oil recovery capacity required. If the required capacity exceeds the applicable cap specified in Table 5 of this appendix, then a facility owner or operator shall ensure, by contract or other approved means as described in §112.2, only for the quantity of resources required to meet the cap, but shall identify sources of additional resources as indicated in section 5.4 of this appendix. The owner or operator of a facility whose planning volume exceeded the cap in 1998 must make arrangements to identify and ensure, by contract or other approved means as described in §112.2, the availability of additional capacity to be under contract by 2003, as appropriate. For a facility that handles multiple groups of oil, the required effective daily recovery capacity for each oil group is calculated before applying the cap. The oil group calculation resulting in the largest on-water recovery volume must be used to plan for the amount of response resources for a worst case discharge, unless the oil group comprises 10 percent or less by volume of the facility's oil storage capacity.

10.3 The procedures discussed in sections 10.3.1 through 10.3.3 of this appendix must be used to calculate the planning volume for identifying shoreline cleanup capacity (for Groups A and B oils).

10.3.1 The following must be determined: the worst case discharge volume of oil for the facility; the appropriate group(s) for the types of oil handled, stored, or transported at the facility (Groups A or B); and the geographic area(s) in which the facility operates (i.e., operating areas). For a facility handling, storing, or transporting oil from different groups, each group must be calculated separately. Using this information, Table 6 of this appendix must be used to determine the percentages of the total volume to be used for shoreline cleanup resource planning.

10.3.2 The shoreline cleanup planning volume must be adjusted to reflect an emulsification factor using the same procedure as described in section 10.2.2 of this appendix.

10.3.3 The resulting volume shall be used to identify an oil spill removal organization with the appropriate shoreline cleanup capability.

10.4 A response plan must identify response resources with fire fighting capability appropriate for the risk of fire and explosion at the facility from the discharge or threat of discharge of oil. The owner or operator of a facility that handles, stores, or transports Group A or B oils that does not have adequate fire fighting resources located at the facility or that cannot rely on sufficient local fire fighting resources must identify adequate fire fighting resources. The facility owner or operator shall ensure, by contract or other approved means as described in §112.2, the availability of these resources. The response plan must also identify an individual to work with the fire department for Group A or B oil fires. This individual shall also verify that sufficient well-trained fire fighting resources are available within a reasonable response time to a worst case scenario. The individual may be the qualified individual identified in the response plan or another appropriate individual located at the facility.

10.5 The following is an example of the procedure described in sections 10.2 and 10.3 of this appendix. A facility with a 37.04 million gallon

(881,904 barrel) capacity of several types of vegetable oils is located in the Inland Operating Area. The vegetable oil with the highest specific gravity stored at the facility is soybean oil (specific gravity 0.922, Group B vegetable oil). The facility has ten aboveground oil storage tanks with a combined total capacity of 18 million gallons (428,571 barrels) and without secondary containment. The remaining facility tanks are inside secondary containment structures. The largest aboveground oil storage tank (3 million gallons or 71,428 barrels) has its own secondary containment. Two 2.1 million gallon (50,000 barrel) tanks (that are not connected by a manifold) are within a common secondary containment tank area, which is capable of holding 4.2 million gallons (100,000 barrels) plus sufficient freeboard.

10.5.1 The worst case discharge for the facility is calculated by adding the capacity of all aboveground vegetable oil storage tanks without secondary containment (18.0 million gallons) plus the capacity of the largest aboveground storage tank inside secondary containment (3.0 million gallons). The resulting worst case discharge is 21 million gallons or 500,000 barrels.

10.5.2 With a specific worst case discharge identified, the planning volume for on-water recovery can be identified as follows:

Worst case discharge: 21 million gallons (500,000 barrels) of Group B vegetable oil

Operating Area: Inland

Planned percent recovered floating vegetable oil (from Table 6, column Nearshore/Inland/Great Lakes): Inland, Group B is 20%

Emulsion factor (from Table 7): 2.0

Planning volumes for on-water recovery: 21,000,000 gallons × 0.2 × 2.0 = 8,400,000 gallons or 200,000 barrels.

Determine required resources for on-water recovery for each of the three tiers using mobilization factors (from Table 4, column Inland/Nearshore/Great Lakes)

Inland Operating Area	Tier 1	Tier 2	Tier 3
Mobilization factor by which you multiply planning volume.........................	.15	.25	.40
Estimated Daily Recovery Capacity (bbls)..	30,000	50,000	80,000

10.5.3 Because the requirements for On-Water Recovery Resources for Tiers 1, 2, and 3 for Inland Operating Area exceed the caps identified in Table 5 of this appendix, the facility owner will contract for a response of 12,500 barrels per day (bpd) for Tier 1, 25,000 bpd for Tier 2, and 50,000 bpd for Tier 3. Resources for the remaining 17,500 bpd for Tier 1, 25,000 bpd for Tier 2, and 30,000 bpd for Tier 3 shall be identified but need not be contracted for in advance.

10.5.4 With the specific worst case discharge identified, the planning volume of onshore recovery can be identified as follows:

Worst case discharge: 21 million gallons (500,000 barrels) of Group B

vegetable oil
Operating Area: Inland
Planned percent recovered floating vegetable oil from onshore (from Table 6, column Nearshore/Inland/Great Lakes): Inland, Group B is 65%
Emulsion factor (from Table 7): 2.0
Planning volumes for shoreline recovery:
21,000,000 gallons × 0.65 × 2.0 = 27,300,000 gallons or 650,000 barrels

10.5.5 The facility owner or operator shall, as appropriate, also identify or contract for quantities of boom identified in the response plan for the protection of fish and wildlife and sensitive environments within the area potentially impacted by a worst case discharge from the facility. For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's “Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments,” (see Appendix E to this part, section 13, for availability) and the applicable ACP. Attachment C–III to Appendix C provides a method for calculating a planning distance to fish and wildlife and sensitive environments and public drinking water intakes that may be adversely affected in the event of a worst case discharge.

10.6 The procedures discussed in sections 10.6.1 through 10.6.3 of this appendix must be used to determine appropriate response resources for facilities with Group C oils.

10.6.1 The owner or operator of a facility that handles, stores, or transports Group C oils shall, as appropriate, identify the response resources available by contract or other approved means, as described in §112.2. The equipment identified in a response plan shall, as appropriate, include:

(1) Sonar, sampling equipment, or other methods for locating the oil on the bottom or suspended in the water column;
(2) Containment boom, sorbent boom, silt curtains, or other methods for containing the oil that may remain floating on the surface or to reduce spreading on the bottom;
(3) Dredges, pumps, or other equipment necessary to recover oil from the bottom and shoreline;
(4) Equipment necessary to assess the impact of such discharges; and
(5) Other appropriate equipment necessary to respond to a discharge involving the type of oil handled, stored, or transported.

10.6.2 Response resources identified in a response plan for a facility that handles, stores, or transports Group C oils under section 10.6.1 of this appendix shall be capable of being deployed on scene within 24 hours of discovery of a discharge.

10.6.3 A response plan must identify response resources with fire fighting capability. The owner or operator of a facility that handles, stores, or transports Group C oils that does not have adequate fire fighting resources located at the facility or that cannot rely on sufficient local fire fighting resources must identify adequate fire fighting resources. The owner or operator shall ensure, by contract or other approved means as described in §112.2, the availability of these resources. The response plan shall also identify an individual located at the facility to work with the fire department for Group C oil fires. This individual shall also verify that sufficient well-trained fire fighting resources are available within a reasonable response time to respond to a worst case discharge. The individual may be the qualified individual identified in the response plan or another appropriate individual located at the facility.

10.7 The procedures described in sections 10.7.1 through 10.7.5 of this appendix must be used to determine appropriate response plan development and evaluation criteria for facilities that handle, store, or transport animal fats and vegetable oils. Refer to section 11 of this appendix for information on the limitations on the use of chemical agents for inland and nearshore areas.

10.7.1 An owner or operator of a facility that handles, stores, or transports animal fats and vegetable oils must provide information in the response plan that identifies:

(1) Procedures and strategies for responding to a worst case discharge of animal fats and vegetable oils to the maximum extent practicable; and

(2) Sources of the equipment and supplies necessary to locate, recover, and mitigate such a discharge.

10.7.2 An owner or operator of a facility that handles, stores, or transports animal fats and vegetable oils must ensure that any equipment identified in a response plan is capable of operating in the geographic area(s) (i.e., operating environments) in which the facility operates using the criteria in Table 1 of this appendix. When evaluating the operability of equipment, the facility owner or operator must consider limitations that are identified in the appropriate ACPs, including:

(1) Ice conditions;

(2) Debris;

(3) Temperature ranges; and

(4) Weather-related visibility.

10.7.3. The owner or operator of a facility that handles, stores, or transports animal fats and vegetable oils must identify the response resources that are available by contract or other approved means, as described in §112.2. The equipment described in the response plan shall, as appropriate, include:

(1) Containment boom, sorbent boom, or other methods for containing oil floating on the surface or to protect shorelines from impact;

(2) Oil recovery devices appropriate for the type of animal fat or vegetable oil carried; and

(3) Other appropriate equipment necessary to respond to a discharge involving the type of oil carried.

10.7.4 Response resources identified in a response plan according to section 10.7.3 of this appendix must be capable of commencing an effective on-scene response within the applicable tier response times in section 5.3 of this appendix.

10.7.5 A response plan must identify response resources with fire fighting capability. The owner or operator of a facility that handles, stores, or transports animal fats and vegetable oils that does not have adequate fire fighting resources located at the facility or that cannot rely on sufficient local fire fighting resources must identify adequate fire fighting resources. The owner or operator shall ensure, by contract or other approved means as described in §112.2, the availability of these resources. The response plan shall also identify an individual located at the facility to work with the fire department for animal fat and vegetable oil fires. This individual shall also verify that sufficient well-trained fire fighting resources are available within a reasonable response time to respond to a worst case discharge. The individual may be the qualified individual identified in the response plan or another appropriate individual located at the facility.

11.0 Determining the Availability of Alternative Response Methods

11.1 For chemical agents to be identified in a response plan, they must be on the NCP Product Schedule that is maintained by EPA. (Some States have a list of approved dispersants for use within State waters. Not all of these State-approved dispersants are listed on the NCP Product Schedule.)

11.2 Identification of chemical agents in the plan does not imply that their use will be authorized. Actual authorization will be governed by the provisions of the NCP and the applicable ACP.

12.0 Additional Equipment Necessary to Sustain Response Operations

12.1 A facility owner or operator shall identify sufficient response resources available, by contract or other approved means as described in §112.2, to respond to a medium discharge of animal fats or vegetables oils for that facility. This will require response resources capable of containing and collecting up to 36,000 gallons of oil or 10 percent of the worst case discharge, whichever is less. All equipment identified must be designed to operate in the applicable operating environment specified in Table 1 of this appendix.

12.2 A facility owner or operator shall evaluate the availability of adequate temporary storage capacity to sustain the effective daily recovery capacities from equipment identified in the plan. Because of the inefficiencies of oil spill recovery devices, response plans must identify daily storage capacity equivalent to twice the effective daily recovery capacity required on-scene. This temporary storage capacity may be reduced if a facility owner or operator can demonstrate by waste stream analysis that the efficiencies of the oil recovery devices, ability to decant waste, or the availability of alternative temporary storage or disposal locations will reduce the overall volume of oily material storage.

12.3 A facility owner or operator shall ensure that response planning includes the capability to arrange for disposal of recovered oil products. Specific disposal procedures will be addressed in the applicable ACP.

13.0 References and Availability

13.1 All materials listed in this section are part of EPA's rulemaking docket and are located in the Superfund Docket, 1235 Jefferson Davis Highway, Crystal Gateway 1, Arlington, Virginia 22202, Suite 105 (Docket Numbers SPCC–2P, SPCC–3P, and SPCC–9P). The docket is available for inspection between 9 a.m. and 4 p.m., Monday through Friday, excluding Federal holidays.

Appointments to review the docket can be made by calling 703–603–9232. Docket hours are subject to change. As provided in 40 CFR part 2, a reasonable fee may be charged for copying services.

13.2 The docket will mail copies of materials to requestors who are outside the Washington, DC metropolitan area. Materials may be available from other sources, as noted in this section. As provided in 40 CFR part 2, a reasonable fee may be charged for copying services. The

RCRA/Superfund Hotline at 800–424–9346 may also provide additional information on where to obtain documents. To contact the RCRA/Superfund Hotline in the Washington, DC metropolitan area, dial 703–412–9810. The Telecommunications Device for the Deaf (TDD) Hotline number is 800–553–7672, or, in the Washington, DC metropolitan area, 703–412–3323.

13.3 Documents

(1) National Preparedness for Response Exercise Program (PREP). The PREP draft guidelines are available from United States Coast Guard Headquarters (G-MEP-4), 2100 Second Street, SW., Washington, DC 20593. (See 58 FR 53990–91, October 19, 1993, Notice of Availability of PREP Guidelines).

(2) "Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments (published in the Federal Register by DOC/NOAA at 59 FR 14713–22, March 29, 1994.). The guidance is available in the Superfund Docket (see sections 13.1 and 13.2 of this appendix).

(3) ASTM Standards. ASTM F 715, ASTM F 989, ASTM F 631–99, ASTM F 808–83 (1999). The ASTM standards are available from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959.

(4) Response Plans for Marine Transportation-Related Facilities, Interim Final Rule. Published by USCG, DOT at 58 FR 7330–76, February 5, 1993.

Table 1 to Appendix E_Response Resource Operating Criteria

Oil Recovery Devices

Operating environment	Significant wave height \1\	Sea state
Rivers and Canals................	[le] 1 foot............	1
Inland...........................	[le] 3 feet............	2
Great Lakes......................	[le] 4 feet............	2-3
Ocean............................	[le] 6 feet............	3-4

Boom

Boom property	Use			
	Rivers and canals	Inland	Great Lakes	Ocean
Significant Wave Height \1\.......	[le] 1............	[le] 3............	[le] 4...........	[le] 6
Sea State.........................	1.................	2.................	2-3.............	3-4
Boom height_inches (draft plus freeboard).	6-18.............	18-42............	18-42............	>=42
Reserve Buoyancy to Weight Ratio..	2:1...............	2:1...............	2:1..............	3:1 to 4:1
Total Tensile Strength_pounds.....	4,500.............	15,000-20,000.....	15,000-20,000....	>=20,000
Skirt Fabric Tensile	200...............	300...............	300..............	500

Strength_pounds.
Skirt Fabric Tear Strength_pounds. 100............... 100.............. 100............. 125

\1\ Oil recovery devices and boom shall be at least capable of operating in wave heights up to and including the values listed in Table 1 for each operating environment.

Table 2 to Appendix E_Removal Capacity Planning Table for Petroleum Oils

Spill location	Rivers and canals			Nearshore/Inland/Great Lakes		
Sustainability of on-water oil recovery	3 days			4 days		
Oil group \1\	Percent natural dissipation	Percent recovered floating oil	Percent oil onshore	Percent natural dissipation	Percent recovered floating oil	Percent oil onshore
1_Non-persistent oils.............	80	10	10	80	20	10
2_Light crudes....................	40	15	45	50	50	30
3_Medium crudes and fuels.........	20	15	65	30	50	50
4_Heavy crudes and fuels..........	5	20	75	10	50	70

\1\ The response resource considerations for non-petroleum oils other than animal fats and vegetable oils are outlined in section 7.7 of this appendix.

Note: Group 5 oils are defined in section 1.2.8 of this appendix; the response resource considerations are outlined in section 7.6 of this appendix.

Table 3 to Appendix E_Emulsification Factors for Petroleum Oil Groups \1\

Non-Persistent Oil:
Group 1... 1.0
Persistent Oil:
Group 2... 1.8
Group 3... 2.0
Group 4... 1.4
Group 5 oils are defined in section 1.2.7 of this appendix; the response resource considerations are outlined in section 7.6 of this appendix.

\1\ See sections 1.2.2 and 1.2.7 of this appendix for group designations for non-persistent and persistent oils, respectively.

Table 4 to Appendix E_On-Water Oil Recovery Resource Mobilization Factors

Operating area	Tier 1	Tier 2	Tier 3
Rivers and Canals..	0.30	0.40	0.60
Inland/Nearshore Great Lakes..................................	0.15	0.25	0.40

Note: These mobilization factors are for total resources mobilized, not incremental response resources.

Table 5 to Appendix E_Response Capability Caps by Operating Area

	Tier 1	Tier 2	Tier 3
February 18, 1993:			
All except Rivers & Canals, Great Lakes................	10K bbls/day	20K bbls/day	40K bbls/day.
Great Lakes..	5K bbls/day	10K bbls/day	20K bbls/day.
Rivers & Canals..	1.5K bbls/day	3.0K bbls/day	6.0K bbls/day.
February 18, 1998:			
All except Rivers & Canals, Great Lakes................	12.5K bbls/day	25K bbls/day	50K bbls/day.
Great Lakes..	6.35K bbls/day	12.3K bbls/day	25K bbls/day.
Rivers & Canals..	1.875K bbls/day	3.75K bbls/day	7.5K bbls/day.
February 18, 2003:			
All except Rivers & Canals, Great Lakes................	TBD	TBD	TBD.
Great Lakes..	TBD	TBD	TBD.
Rivers & Canals..	TBD	TBD	TBD.

Note: The caps show cumulative overall effective daily recovery capacity, not incremental increases.
TBD=To Be Determined.

Table 6 to Appendix E_Removal Capacity Planning Table for Animal Fats and Vegetable Oils

Spill location	Rivers and canals			Nearshore/Inland/Great Lakes		
Sustainability of on-water oil recovery	3 days			4 days		
Oil group \1\	Percent natural loss	Percent recovered floating oil	Percent recovered oil from onshore	Percent natural loss	Percent recovered floating oil	Percent recovered oil from onshore

Group A...........................	40	15	45	50	20	30
Group B...........................	20	15	65	30	20	50

\1\ Substances with a specific gravity greater than 1.0 generally sink below the surface of the water. Response resource considerations are outlined in section 10.6 of this appendix. The owner or operator of the facility is responsible for determining appropriate response resources for Group C oils including locating oil on the bottom or suspended in the water column; containment boom or other appropriate methods for containing oil that may remain floating on the surface; and dredges, pumps, or other equipment to recover animal fats or vegetable oils from the bottom and shoreline.

Note: Group C oils are defined in sections 1.2.1 and 1.2.9 of this appendix; the response resource procedures are discussed in section 10.6 of this appendix.

Table 7 to Appendix E_Emulsification Factors for Animal Fats and Vegetable Oils

Oil Group \1\:	
Group A..	1.0
Group B..	2.0

\1\ Substances with a specific gravity greater than 1.0 generally sink below the surface of the water. Response resource considerations are outlined in section 10.6 of this appendix. The owner or operator of the facility is responsible for determining appropriate response resources for Group C oils including locating oil on the bottom or suspended in the water column; containment boom or other appropriate methods for containing oil that may remain floating on the surface; and dredges, pumps, or other equipment to recover animal fats or vegetable oils from the bottom and shoreline.

Note: Group C oils are defined in sections 1.2.1 and 1.2.9 of this appendix; the response resource procedures are discussed in section 10.6 of this appendix.

Attachments to Appendix E

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[59 FR 34111, July 1, 1994; 59 FR 49006, Sept. 26, 1994, as amended at 65 FR 40806, 40807, June 30, 2000; 65 FR 47325, Aug. 2, 2000; 66 FR 47325, Aug. 2, 2000; 66 FR 35460, 35461, June 29, 2001]

Appendix F to Part 112—Facility-Specific Response Plan

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1.0 Model Facility-Specific Response Plan

(A) Owners or operators of facilities regulated under this part which pose a threat of substantial harm to the environment by discharging oil into or on navigable waters or adjoining shorelines are required to prepare and submit facility-specific response plans to EPA in accordance with the provisions in this appendix. This appendix further describes the required elements in §112.20(h).

(B) Response plans must be sent to the appropriate EPA Regional office. Figure F–1 of this Appendix lists each EPA Regional office and the address where owners or operators must submit their response plans. Those facilities deemed by the Regional Administrator (RA) to pose a threat of significant and substantial harm to the environment will have their plans reviewed and approved by EPA. In certain cases, information required in the model response plan is similar to information currently maintained in the facility's Spill Prevention, Control, and Countermeasures (SPCC) Plan as required by 40 CFR 112.3. In these cases, owners or operators may reproduce the information and include a photocopy in the response plan.

(C) A complex may develop a single response plan with a set of core elements for all regulating agencies and separate sections for the non-transportation-related and transportation-related components, as described in §112.20(h). Owners or operators of large facilities that handle, store, or transport oil at more than one geographically distinct location (e.g., oil storage areas at opposite ends of a single, continuous parcel of property) shall, as appropriate, develop separate sections of the response plan for each storage area.

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1.1 Emergency Response Action Plan

Several sections of the response plan shall be co-located for easy access by response personnel during an actual emergency or oil discharge. This collection of sections shall be called the Emergency Response Action Plan. The Agency intends that the Action Plan contain only as much information as is necessary to combat the discharge and be arranged so response actions are not delayed. The Action Plan may be arranged in a number of ways. For example, the sections of the Emergency Response Action Plan may be photocopies or condensed versions of the forms included in the associated sections of the response plan. Each Emergency Response Action Plan section may be tabbed for quick reference. The Action Plan shall be maintained in the front of the same binder that contains the complete response plan or it shall be contained in a separate binder. In the latter case, both binders shall be kept together so that the entire plan can be accessed by the qualified individual and appropriate spill response personnel. The Emergency Response Action Plan shall be made up of the following sections:

1. Qualified Individual Information (Section 1.2) partial
2. Emergency Notification Phone List (Section 1.3.1) partial
3. Spill Response Notification Form (Section 1.3.1) partial
4. Response Equipment List and Location (Section 1.3.2) complete
5. Response Equipment Testing and Deployment (Section 1.3.3) complete
6. Facility Response Team (Section 1.3.4) partial
7. Evacuation Plan (Section 1.3.5) condensed
8. Immediate Actions (Section 1.7.1) complete
9. Facility Diagram (Section 1.9) complete

1.2 Facility Information

The facility information form is designed to provide an overview of the site and a description of past activities at the facility. Much of the information required by this section may be obtained from the facility's existing SPCC Plan.

1.2.1 Facility name and location: Enter facility name and street address. Enter the address of corporate headquarters only if corporate headquarters are physically located at the facility. Include city, county, state, zip code, and phone number.

1.2.2 Latitude and Longitude: Enter the latitude and longitude of the facility. Include degrees, minutes, and seconds of the main entrance of the facility.

1.2.3 Wellhead Protection Area: Indicate if the facility is located in or drains into a wellhead protection area as defined by the Safe Drinking Water Act of 1986 (SDWA). 1 The response plan requirements in the Wellhead Protection Program are outlined by the State or Territory in which the facility resides.

1 A wellhead protection area is defined as the surface and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield. For further information regarding State and territory protection programs, facility owners or operators may contact the SDWA Hotline at 1–800–426–4791.

1.2.4 Owner/operator: Write the name of the company or person operating the facility and the name of the person or company that owns the facility, if the two are different. List the address of the owner, if the two are different.

1.2.5 Qualified Individual: Write the name of the qualified individual for the entire facility. If more than one person is listed, each individual indicated in this section shall have full authority to implement the facility response plan. For each individual, list: name, position, home and work addresses (street addresses, not P.O. boxes), emergency phone number, and specific response training experience.

1.2.6 Date of Oil Storage Start-up: Enter the year which the present facility first started storing oil.

1.2.7 Current Operation: Briefly describe the facility's operations and include the North American Industrial Classification System (NAICS) code.

1.2.8 Dates and Type of Substantial Expansion: Include information on expansions that have occurred at the facility. Examples of such expansions include, but are not limited to: Throughput expansion, addition of a product line, change of a product line, and installation of additional oil storage capacity. The data provided shall include all facility historical information and detail the expansion of the facility. An example of substantial expansion is any material alteration of the facility which causes the owner or operator of the facility to re-evaluate and increase the response equipment necessary to adequately respond to a worst case discharge from the facility.

Date of Last Update: ___

Facility Information Form

Facility Name:_____________________

Location (Street Address): _____________________

City: ___ State: ___ Zip: ___

County: ___ Phone Number: (   ) ___

Latitude: ___ Degrees ___ Minutes ___ Seconds

Longitude: ___ Degrees ___ Minutes ___ Seconds

Wellhead Protection Area: _____________________

Owner: _____________________

Owner Location (Street Address):_____________________

(if different from Facility Address)

City: ___ State:___ Zip: ___

County: ___ Phone Number: (   ) ___

Operator (if not Owner): _____________________

Qualified Individual(s): (attach additional sheets if more than one)

Name: _____________________

Position: _____________________

Work Address: _____________________

Home Address: _____________________

Emergency Phone Number: (   ) _____________________

Date of Oil Storage Start-up: _____________________

Current Operations: _____________________

____

____

Date(s) and Type(s) of Substantial Expansion(s): _____________________

____

(Attach additional sheets if necessary)

1.3 Emergency Response Information

(A) The information provided in this section shall describe what will be needed in an actual emergency involving the discharge of oil or a combination of hazardous substances and oil discharge. The Emergency Response Information section of the plan must include the following components:

(1) The information provided in the Emergency Notification Phone List in section 1.3.1 identifies and prioritizes the names and phone numbers of the organizations and personnel that need to be notified immediately in the event of an emergency. This section shall include all the appropriate phone numbers for the facility. These numbers must be verified each time the plan is updated. The contact list must be accessible to all facility employees to ensure that, in case of a discharge, any employee on site could immediately notify the appropriate parties.

(2) The Spill Response Notification Form in section 1.3.1 creates a checklist of information that shall be provided to the National Response Center (NRC) and other response personnel. All information on this checklist must be known at the time of notification, or be in the process of being collected. This notification form is based on a similar form used by the NRC. Note: Do not delay spill notification to collect the information on the list.
(3) Section 1.3.2 provides a description of the facility's list of emergency response equipment and location of the response equipment. When appropriate, the amount of oil that emergency response equipment can handle and any limitations (e.g., launching sites) must be described.
(4) Section 1.3.3 provides information regarding response equipment tests and deployment drills. Response equipment deployment exercises shall be conducted to ensure that response equipment is operational and the personnel who would operate the equipment in a spill response are capable of deploying and operating it. Only a representative sample of each type of response equipment needs to be deployed and operated, as long as the remainder is properly maintained. If appropriate, testing of response equipment may be conducted while it is being deployed. Facilities without facility-owned response equipment must ensure that the oil spill removal organization that is identified in the response plan to provide this response equipment certifies that the deployment exercises have been met. Refer to the National Preparedness for Response Exercise Program (PREP) Guidelines (see Appendix E to this part, section 13, for availability), which satisfy Oil Pollution Act (OPA) response exercise requirements.
(5) Section 1.3.4 lists the facility response personnel, including those employed by the facility and those under contract to the facility for response activities, the amount of time needed for personnel to respond, their responsibility in the case of an emergency, and their level of response training. Three different forms are included in this section. The Emergency Response Personnel List shall be composed of all personnel employed by the facility whose duties involve responding to emergencies, including oil discharges, even when they are not physically present at the site. An example of this type of person would be the Building Engineer-in-Charge or Plant Fire Chief. The second form is a list of the Emergency Response Contractors (both primary and secondary) retained by the facility. Any changes in contractor status must be reflected in updates to the response plan. Evidence of contracts with response contractors shall be included in this section so that the availability of resources can be verified. The last form is the Facility Response Team List, which shall be composed of both emergency response personnel (referenced by job title/position) and emergency response contractors, included in one of the two lists described above, that will respond immediately upon discovery of an oil discharge or other emergency (i.e., the first people to respond). These are to be persons normally on the facility premises or primary response contractors. Examples of these personnel would be the Facility Hazardous Materials (HAZMAT) Spill Team 1, Facility Fire Engine Company 1, Production Supervisor, or Transfer Supervisor. Company personnel must be able to respond immediately and adequately if contractor support is not available.
(6) Section 1.3.5 lists factors that must, as appropriate, be considered

when preparing an evacuation plan.

(7) Section 1.3.6 references the responsibilities of the qualified individual for the facility in the event of an emergency.

(B) The information provided in the emergency response section will aid in the assessment of the facility's ability to respond to a worst case discharge and will identify additional assistance that may be needed. In addition, the facility owner or operator may want to produce a wallet-size card containing a checklist of the immediate response and notification steps to be taken in the event of an oil discharge.

1.3.1 Notification

Date of Last Update:____________________

Emergency Notification Phone List Whom To Notify

Reporter's Name:____________________

Date:____________________

Facility Name:____________________

Owner Name:____________________

Facility Identification Number:____________________

Date and Time of Each NRC Notification:____________________

Organization	Phone No.
1. National Response Center (NRC):	1-800-424-8802
2. Qualified Individual:	------------------
Evening Phone:	------------------
3. Company Response Team:	------------------
Evening Phone:	------------------
4. Federal On-Scene Coordinator (OSC) and/or Regional Response Center (RRC):	------------------
Evening Phone(s):	------------------
Pager Number(s):	------------------
5. Local Response Team (Fire Dept./Cooperatives):	------------------
6. Fire Marshall:	------------------
Evening Phone:	------------------
7. State Emergency Response Commission (SERC):	------------------
Evening Phone:	

----
8. State Police:
----
9. Local Emergency Planning Committee (LEPC):
----
10. Local Water Supply System:

Evening Phone:
----
11. Weather Report:
----
12. Local Television/Radio Station for Evacuation Notification:
----
13. Hospitals:

Spill Response Notification Form

Reporter's Last Name:______________________
First:______________________
M.I.:______________________
Position:______________________

Phone Numbers:
Day (   )   –
Evening (   )   –
Company:______________________
Organization Type:______________________
Address:______________________
____
City:______________________
State:______________________
Zip:______________________

Were Materials Discharged? ___ (Y/N) Confidential? ___ (Y/N)
Meeting Federal Obligations to Report? ___ (Y/N) Date Called: ___
Calling for Responsible Party? ___ (Y/N) Time Called: ___
Incident Description
Source and/or Cause of Incident:______________________
____
____
____
____
Date of Incident:______________________

Time of Incident: ___ AM/PM
Incident Address/Location:______________________
____

Nearest City:_________ State: ___ County: ____ Zip: ____

Distance from City: ___ Units of Measure: ___ Direction from City: ___
Section: ____ Township: ____ Range: ____ Borough: ____
Container Type: ___ Tank Oil Storage Capacity: ____ Units of Measure: ___
Facility Oil Storage Capacity: ____ Units of Measure: ___
Facility Latitude: ___ Degrees ___ Minutes ___ Seconds
Facility Longitude: ___ Degrees ___ Minutes ___ Seconds
Material

CHRIS Code	Discharged quantity	Unit of measure	Material Discharged in water Quantity	Unit of measure

Response Action
Actions Taken to Correct, Control or Mitigate Incident:
____
____
____
____

Impact
Number of Injuries: ___ Number of Deaths: ___
Were there Evacuations? ___ (Y/N) Number Evacuated: ___
Was there any Damage? ___ (Y/N)
Damage in Dollars (approximate):_____________________
Medium Affected:_____________________
Description:_____________________
More Information about Medium:_____________________
____
____

Additional Information
Any information about the incident not recorded elsewhere in the report:

____
____
____

Caller Notifications
EPA? ___ (Y/N) USCG? ___ (Y/N) State? ___ (Y/N)
Other? ___ (Y/N) Describe: ______
1.3.2 Response Equipment List
Date of Last Update:___
Facility Response Equipment List
1. Skimmers/Pumps—Operational Status: _____________________
Type, Model, and Year: _____________________
____

Type Model Year
Number: _____________________

Capacity: ____ gal./min.
Daily Effective Recovery Rate: _____________________
Storage Location(s): _____________________
Date Fuel Last Changed: _____________________
2. Boom—Operational Status: _____________________
Type, Model, and Year:_____________________

Type Model Year
Number: _____________________

Size (length): ____ ft.
Containment Area: ____ sq. ft.
Storage Location:_____________________

3. Chemicals Stored (Dispersants listed on EPA's NCP Product Schedule)

Type	Amount	Date purchased	Treatment capacity	Storage location

Were appropriate procedures used to receive approval for use of dispersants in accordance with the NCP (40 CFR 300.910) and the Area Contingency Plan (ACP), where applicable?___ (Y/N).
Name and State of On-Scene Coordinator (OSC) authorizing use: ___ .

Date Authorized: ___ .

4. Dispersant Dispensing Equipment—Operational Status: ___ .

Type and year	Capacity	Storage location	Response time (minutes)

5. Sorbents—Operational Status: _____________________

Type and Year Purchased: _____________________

Amount: _____________________

Absorption Capacity (gal.): _____________________

Storage Location(s): _____________________

6. Hand Tools—Operational Status: _____________________

Type and year	Quantity	Storage location

7. Communication Equipment (include operating frequency and channel and/or cellular phone numbers)—Operational Status: ___

Type and year	Quantity	Storage location/ number

8. Fire Fighting and Personnel Protective Equipment—Operational Status: ___

Type and year	Quantity	Storage location

9. Other (e.g., Heavy Equipment, Boats and Motors)—Operational Status: ___

Type and year	Quantity	Storage location

1.3.3 Response Equipment Testing/Deployment

Date of Last Update:____

Response Equipment Testing and Deployment Drill Log

Last Inspection or Response Equipment Test Date: ______________________

Inspection Frequency: ______________________

Last Deployment Drill Date: ______________________

Deployment Frequency: ______________________

Oil Spill Removal Organization Certification (if applicable): ______________________

1.3.4 Personnel

Date of Last Update:____

Emergency Response Personnel

Company Personnel

Responsibility during response

Name	Phone \1\	Response time	action Response training type/date
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

\1\ Phone number to be used when person is not on-site.

Emergency Response Contractors

Date of Last Update: ____

Contractor	Phone	Response time	Contract responsibility \1\
1.			

2.

3.

4.

\1\ Include evidence of contracts/agreements with response contractors to ensure the availability of personnel
and response equipment.

Facility Response Team
Date of Last Update:____

Team member	Response time (minutes)	Phone or pager number (day/ evening)
Qualified Individual:	....	/
	....	/
	....	/
	....	/
	....	/
	....	/
	....	/

.... /

.... /

.... /

.... /

.... /

.... /

.... /

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.... /

.... /

.... /

Note: If the facility uses contracted help in an emergency response situation, the owner or operator must provide the contractors' names and review the contractors' capacities to provide adequate personnel and response equipment.

1.3.5 Evacuation Plans

1.3.5.1 Based on the analysis of the facility, as discussed elsewhere in the plan, a facility-wide evacuation plan shall be developed. In addition, plans to evacuate parts of the facility that are at a high risk of exposure in the event of a discharge or other release must be developed. Evacuation routes must be shown on a diagram of the facility (see section 1.9 of this appendix). When developing evacuation plans, consideration must be given to the following factors, as appropriate:

(1) Location of stored materials;
(2) Hazard imposed by discharged material;
(3) Discharge flow direction;
(4) Prevailing wind direction and speed;
(5) Water currents, tides, or wave conditions (if applicable);
(6) Arrival route of emergency response personnel and response equipment;
(7) Evacuation routes;
(8) Alternative routes of evacuation;
(9) Transportation of injured personnel to nearest emergency medical facility;
(10) Location of alarm/notification systems;
(11) The need for a centralized check-in area for evacuation validation (roll call);
(12) Selection of a mitigation command center; and
(13) Location of shelter at the facility as an alternative to evacuation.

1.3.5.2 One resource that may be helpful to owners or operators in preparing this section of the response plan is The Handbook of Chemical Hazard Analysis Procedures by the Federal Emergency Management Agency (FEMA), Department of Transportation (DOT), and EPA. The Handbook of Chemical Hazard Analysis Procedures is available from: FEMA , Publication Office, 500 C. Street, S.W., Washington, DC 20472, (202) 646–3484.

1.3.5.3 As specified in §112.20(h)(1)(vi), the facility owner or operator must reference existing community evacuation plans, as appropriate.

1.3.6 Qualified Individual's Duties

The duties of the designated qualified individual are specified in §112.20(h)(3)(ix). The qualified individual's duties must be described and be consistent with the minimum requirements in §112.20(h)(3)(ix). In addition, the qualified individual must be identified with the Facility Information in section 1.2 of the response plan.

1.4 Hazard Evaluation

This section requires the facility owner or operator to examine the facility's operations closely and to predict where discharges could occur. Hazard evaluation is a widely used industry practice that allows facility owners or operators to develop a complete understanding of potential hazards and the response actions necessary to address these hazards. The Handbook of Chemical Hazard Analysis Procedures, prepared by the EPA, DOT, and the FEMA and the Hazardous Materials Emergency Planning Guide (NRT–1), prepared by the National Response Team are good references for conducting a hazard analysis. Hazard identification and evaluation will assist facility owners or operators in planning for potential discharges, thereby reducing the severity of discharge impacts that may occur in the future. The evaluation also may help the operator identify and correct potential sources of discharges. In addition, special hazards to workers and emergency response personnel's health and safety shall be evaluated, as well as the facility's oil spill history.

1.4.1 Hazard Identification

The Tank and Surface Impoundment (SI) forms, or their equivalent, that are part of this section must be completed according to the directions below. (“Surface Impoundment” means a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold an accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well or a seepage facility.) Similar worksheets, or their equivalent, must be developed for any other type of storage containers.

(1) List each tank at the facility with a separate and distinct identifier. Begin aboveground tank identifiers with an “A” and belowground tank identifiers with a “B”, or submit multiple sheets with the aboveground tanks and belowground tanks on separate sheets.

(2) Use gallons for the maximum capacity of a tank; and use square feet for the area.

(3) Using the appropriate identifiers and the following instructions, fill in the appropriate forms:

(a) Tank or SI number—Using the aforementioned identifiers (A or B) or multiple reporting sheets, identify each tank or SI at the facility that stores oil or hazardous materials.

(b) Substance Stored—For each tank or SI identified, record the material that is stored therein. If the tank or SI is used to store more than one material, list all of the stored materials.
(c) Quantity Stored—For each material stored in each tank or SI, report the average volume of material stored on any given day.
(d) Tank Type or Surface Area/Year—For each tank, report the type of tank (e.g., floating top), and the year the tank was originally installed. If the tank has been refabricated, the year that the latest refabrication was completed must be recorded in parentheses next to the year installed. For each SI, record the surface area of the impoundment and the year it went into service.
(e) Maximum Capacity—Record the operational maximum capacity for each tank and SI. If the maximum capacity varies with the season, record the upper and lower limits.
(f) Failure/Cause—Record the cause and date of any tank or SI failure which has resulted in a loss of tank or SI contents.
(4) Using the numbers from the tank and SI forms, label a schematic drawing of the facility. This drawing shall be identical to any schematic drawings included in the SPCC Plan.
(5) Using knowledge of the facility and its operations, describe the following in writing:
(a) The loading and unloading of transportation vehicles that risk the discharge of oil or release of hazardous substances during transport processes. These operations may include loading and unloading of trucks, railroad cars, or vessels. Estimate the volume of material involved in transfer operations, if the exact volume cannot be determined.
(b) Day-to-day operations that may present a risk of discharging oil or releasing a hazardous substance. These activities include scheduled venting, piping repair or replacement, valve maintenance, transfer of tank contents from one tank to another, etc. (not including transportation-related activities). Estimate the volume of material involved in these operations, if the exact volume cannot be determined.
(c) The secondary containment volume associated with each tank and/or transfer point at the facility. The numbering scheme developed on the tables, or an equivalent system, must be used to identify each containment area. Capacities must be listed for each individual unit (tanks, slumps, drainage traps, and ponds), as well as the facility total.
(d) Normal daily throughput for the facility and any effect on potential discharge volumes that a negative or positive change in that throughput may cause.

Hazard Identification Tanks \1\
Date of Last Update: ____

Tank No.	Substance Stored (Oil and Hazardous Substance)	Quantity Stored (gallons)	Tank Type/Year	Maximum Capacity (gallons)	Failure/Cause

----

\1\ Tank = any container that stores oil.
Attach as many sheets as necessary.

Hazard Identification Surface Impoundments (SIs)
Date of Last Update: ____

Quantity Stored Maximum Capacity
SI No. Substance Stored (gallons) Surface Area/Year
(gallons) Failure/Cause

Attach as many sheets as necessary.

1.4.2 Vulnerability Analysis

The vulnerability analysis shall address the potential effects (i.e., to human health, property, or the environment) of an oil discharge. Attachment C–III to Appendix C to this part provides a method that owners or operators shall use to determine appropriate distances from the facility to fish and wildlife and sensitive environments. Owners or operators can use a comparable formula that is considered acceptable by the RA. If a comparable formula is used, documentation of the reliability and analytical soundness of the formula must be attached to the response plan cover sheet. This analysis must be prepared for each facility and, as appropriate, must discuss the vulnerability of:

(1) Water intakes (drinking, cooling, or other);
(2) Schools;
(3) Medical facilities;
(4) Residential areas;
(5) Businesses;
(6) Wetlands or other sensitive environments; 2

2 Refer to the DOC/NOAA “Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments” (See appendix E to this part, section 13, for availability).

(7) Fish and wildlife;
(8) Lakes and streams;
(9) Endangered flora and fauna;
(10) Recreational areas;
(11) Transportation routes (air, land, and water);
(12) Utilities; and
(13) Other areas of economic importance (e.g., beaches, marinas) including terrestrially sensitive environments, aquatic environments, and unique habitats.

1.4.3 Analysis of the Potential for an Oil Discharge

Each owner or operator shall analyze the probability of a discharge occurring at the facility. This analysis shall incorporate factors such as oil discharge history, horizontal range of a potential discharge, and vulnerability to natural disaster, and shall, as appropriate, incorporate other factors such as tank age. This analysis will provide information for developing discharge scenarios for a worst case discharge and small and medium discharges and aid in the development of techniques to reduce the size and frequency of discharges. The owner or operator may need to research the age of the tanks the oil discharge history at the facility.

1.4.4 Facility Reportable Oil Spill History

Briefly describe the facility's reportable oil spill 3 history for the entire life of the facility to the extent that such information is reasonably identifiable, including:

3 As described in 40 CFR part 110, reportable oil spills are those that: (a) violate applicable water quality standards, or (b) cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.

(1) Date of discharge(s);
(2) List of discharge causes;
(3) Material(s) discharged;
(4) Amount discharged in gallons;
(5) Amount of discharge that reached navigable waters, if applicable;
(6) Effectiveness and capacity of secondary containment;
(7) Clean-up actions taken;
(8) Steps taken to reduce possibility of recurrence;
(9) Total oil storage capacity of the tank(s) or impoundment(s) from which the material discharged;
(10) Enforcement actions;
(11) Effectiveness of monitoring equipment; and
(12) Description(s) of how each oil discharge was detected.

The information solicited in this section may be similar to requirements in 40 CFR 112.4(a). Any duplicate information required by §112.4(a) may be photocopied and inserted.

1.5 Discharge Scenarios

In this section, the owner or operator is required to provide a description of the facility's worst case discharge, as well as a small and medium discharge, as appropriate. A multi-level planning approach has been chosen because the response actions to a discharge (i.e., necessary response equipment, products, and personnel) are dependent on the magnitude of the discharge. Planning for lesser discharges is necessary because the nature of the response may be qualitatively different depending on the quantity of the discharge. The facility owner or operator shall discuss the potential direction of the discharge pathway.

1.5.1 Small and Medium Discharges

1.5.1.1 To address multi-level planning requirements, the owner or operator must consider types of facility-specific discharge scenarios that may contribute to a small or medium discharge. The scenarios shall account for all the operations that take place at the facility, including but not limited to:

(1) Loading and unloading of surface transportation;
(2) Facility maintenance;
(3) Facility piping;
(4) Pumping stations and sumps;
(5) Oil storage tanks;
(6) Vehicle refueling; and
(7) Age and condition of facility and components.

1.5.1.2 The scenarios shall also consider factors that affect the response efforts required by the facility. These include but are not limited to:

(1) Size of the discharge;
(2) Proximity to downgradient wells, waterways, and drinking water intakes;
(3) Proximity to fish and wildlife and sensitive environments;
(4) Likelihood that the discharge will travel offsite (i.e., topography, drainage);
(5) Location of the material discharged (i.e., on a concrete pad or directly on the soil);
(6) Material discharged;
(7) Weather or aquatic conditions (i.e., river flow);
(8) Available remediation equipment;
(9) Probability of a chain reaction of failures; and
(10) Direction of discharge pathway.

1.5.2 Worst Case Discharge

1.5.2.1 In this section, the owner or operator must identify the worst case discharge volume at the facility. Worksheets for production and non-production facility owners or operators to use when calculating worst case discharge are presented in Appendix D to this part. When planning for the worst case discharge response, all of the aforementioned factors listed in the small and medium discharge section of the response plan shall be addressed.

1.5.2.2 For onshore storage facilities and production facilities, permanently manifolded oil storage tanks are defined as tanks that are designed, installed, and/or operated in such a manner that the multiple tanks function as one storage unit (i.e., multiple tank volumes are equalized). In this section of the response plan, owners or operators must provide evidence that oil storage tanks with common piping or piping systems are not operated as one unit. If such evidence is provided and is acceptable to the RA, the worst case discharge volume shall be based on the combined oil storage capacity of all manifold tanks or the oil storage capacity of the largest single oil storage tank within the secondary containment area, whichever is greater. For permanently manifolded oil storage tanks that function as one storage unit, the worst case discharge shall be based on the combined oil storage capacity of all manifolded tanks or the oil storage capacity of the largest single tank within a secondary containment area, whichever is greater. For purposes of the worst case discharge calculation, permanently manifolded oil storage tanks that are separated by internal divisions for each tank are considered to be single tanks and individual manifolded tank volumes are not combined.

1.6 Discharge Detection Systems

In this section, the facility owner or operator shall provide a detailed description of the procedures and equipment used to detect discharges. A section on discharge detection by personnel and a discussion of automated discharge detection, if applicable, shall be included for both regular operations and after hours operations. In addition, the facility owner or operator shall discuss how the reliability of any automated system will be checked and how frequently the system will be inspected.

1.6.1 Discharge Detection by Personnel

In this section, facility owners or operators shall describe the procedures and personnel that will detect any discharge of oil or release of a hazardous substance. A thorough discussion of facility inspections must be included. In addition, a description of initial response actions shall be addressed. This section shall reference section 1.3.1 of the response plan for emergency response information.

1.6.2 Automated Discharge Detection

In this section, facility owners or operators must describe any automated discharge detection equipment that the facility has in place. This section shall include a discussion of overfill alarms, secondary containment sensors, etc. A discussion of the plans to verify an automated alarm and the actions to be taken once verified must also be included.

1.7 Plan Implementation

In this section, facility owners or operators must explain in detail how to implement the facility's emergency response plan by describing response actions to be carried out under the plan to ensure the safety of the facility and to mitigate or prevent discharges described in section 1.5 of the response plan. This section shall include the identification of response resources for small, medium, and worst case discharges; disposal plans; and containment and drainage planning. A list of those personnel who would be involved in the cleanup shall be identified. Procedures that the facility will use, where appropriate or necessary, to update their plan after an oil discharge event and the time frame to update the plan must be described.

1.7.1 Response Resources for Small, Medium, and Worst Case Discharages

1.7.1.1 Once the discharge scenarios have been identified in section 1.5 of the response plan, the facility owner or operator shall identify and describe implementation of the response actions. The facility owner or operator shall demonstrate accessibility to the proper response personnel and equipment to effectively respond to all of the identified discharge scenarios. The determination and demonstration of adequate response capability are presented in Appendix E to this part. In addition, steps to expedite the cleanup of oil discharges must be discussed. At a minimum, the following items must be addressed:

(1) Emergency plans for spill response;

(2) Additional response training;
(3) Additional contracted help;
(4) Access to additional response equipment/experts; and
(5) Ability to implement the plan including response training and practice drills.
1.7.1.2A recommended form detailing immediate actions follows.

Oil Spill Response_Immediate Actions

1. Stop the product flow..................	Act quickly to secure pumps, close valves, etc.
2. Warn personnel.........................	Enforce safety and security measures.
3. Shut off ignition sources.............	Motors, electrical circuits, open flames, etc.
4. Initiate containment...................	Around the tank and/or in the water with oil boom.
5. Notify NRC.............................	1-800-424-8802
6. Notify OSC	
7. Notify, as appropriate	

Source: FOSS, Oil Spill Response_Emergency Procedures, Revised December 3, 1992.

1.7.2 Disposal Plans

1.7.2.1 Facility owners or operators must describe how and where the facility intends to recover, reuse, decontaminate, or dispose of materials after a discharge has taken place. The appropriate permits required to transport or dispose of recovered materials according to local, State, and Federal requirements must be addressed. Materials that must be accounted for in the disposal plan, as appropriate, include:
(1) Recovered product;
(2) Contaminated soil;
(3) Contaminated equipment and materials, including drums, tank parts, valves, and shovels;
(4) Personnel protective equipment;
(5) Decontamination solutions;
(6) Adsorbents; and
(7) Spent chemicals.

1.7.2.2 These plans must be prepared in accordance with Federal (e.g., the Resource Conservation and Recovery Act [RCRA]), State, and local regulations, where applicable. A copy of the disposal plans from the facility's SPCC Plan may be inserted with this section, including any diagrams in those plans.

Material	Disposal facility	Location	RCRA permit/ manifest

1.

2.

3.

4.

1.7.3 Containment and Drainage Planning

A proper plan to contain and control a discharge through drainage may limit the threat of harm to human health and the environment. This section shall describe how to contain and control a discharge through drainage, including:

(1) The available volume of containment (use the information presented in section 1.4.1 of the response plan);

(2) The route of drainage from oil storage and transfer areas;

(3) The construction materials used in drainage troughs;

(4) The type and number of valves and separators used in the drainage system;

(5) Sump pump capacities;

(6) The containment capacity of weirs and booms that might be used and their location (see section 1.3.2 of this appendix); and

(7) Other cleanup materials.

In addition, a facility owner or operator must meet the inspection and monitoring requirements for drainage contained in 40 CFR part 112, subparts A through C. A copy of the containment and drainage plans that are required in 40 CFR part 112, subparts A through C may be inserted in this section, including any diagrams in those plans.

Note: The general permit for stormwater drainage may contain additional requirements.

1.8 Self-Inspection, Drills/Exercises, and Response Training

The owner or operator must develop programs for facility response training and for drills/exercises according to the requirements of 40 CFR 112.21. Logs must be kept for facility drills/exercises, personnel response training, and spill prevention meetings. Much of the recordkeeping information required by this section is also contained in the SPCC Plan required by 40 CFR 112.3. These logs may be included in the facility response plan or kept as an annex to the facility response plan.

1.8.1 Facility Self-Inspection

Under 40 CFR 112.7(e), you must include the written procedures and records of inspections for each facility in the SPCC Plan. You must include the inspection records for each container, secondary containment, and item of response equipment at the facility. You must cross-reference the records of inspections of each container and secondary containment required by 40 CFR 112.7(e) in the facility response plan. The inspection record of response equipment is a new requirement in this plan. Facility self-inspection requires two-steps: (1) a checklist of things to inspect; and (2) a method of recording the actual inspection and its findings. You must note the date of each inspection. You must keep facility response plan records for five years. You must keep SPCC records for three years.

1.8.1.1. Tank Inspection

The tank inspection checklist presented below has been included as guidance during inspections and monitoring. Similar requirements exist in 40 CFR part 112, subparts A through C. Duplicate information from the SPCC Plan may be photocopied and inserted in this section. The inspection checklist consists of the following items:

Tank Inspection Checklist

1. Check tanks for leaks, specifically looking for:

A. drip marks;
B. discoloration of tanks;
C. puddles containing spilled or leaked material;
D. corrosion;
E. cracks; and
F. localized dead vegetation.

2. Check foundation for:

A. cracks;
B. discoloration;
C. puddles containing spilled or leaked material;
D. settling;
E. gaps between tank and foundation; and
F. damage caused by vegetation roots.

3. Check piping for:

A. droplets of stored material;
B. discoloration;
C. corrosion;
D. bowing of pipe between supports;
E. evidence of stored material seepage from valves or seals; and
F. localized dead vegetation.

Tank/Surface Impoundment Inspection Log

Inspector	Tank or SI#	Date	Comments

1.8.1.2 Response Equipment Inspection

Using the Emergency Response Equipment List provided in section 1.3.2 of the response plan, describe each type of response equipment, checking for the following:

Response Equipment Checklist

1. Inventory (item and quantity);
2. Storage location;
3. Accessibility (time to access and respond);
4. Operational status/condition;
5. Actual use/testing (last test date and frequency of testing); and
6. Shelf life (present age, expected replacement date).

Please note any discrepancies between this list and the available response equipment.

Response Equipment Inspection Log

[Use section 1.3.2 of the response plan as a checklist]

Inspector	Date	Comments

1.8.1.3 Secondary Containment Inspection

Inspect the secondary containment (as described in sections 1.4.1 and 1.7.2 of the response plan), checking the following:

Secondary Containment Checklist

1. Dike or berm system.

A. Level of precipitation in dike/available capacity;

B. Operational status of drainage valves;

C. Dike or berm permeability;

D. Debris;

E. Erosion;

F. Permeability of the earthen floor of diked area; and

G. Location/status of pipes, inlets, drainage beneath tanks, etc.
2. Secondary containment
A. Cracks;
B. Discoloration;
C. Presence of spilled or leaked material (standing liquid);
D. Corrosion; and
E. Valve conditions.
3. Retention and drainage ponds
A. Erosion;
B. Available capacity;
C. Presence of spilled or leaked material;
D. Debris; and
E. Stressed vegetation.
The tank inspection checklist presented below has been included as guidance during inspections and monitoring. Similar requirements exist in 40 CFR part 112, subparts A through C. Similar requirements exist in 40 CFR 112.7(e). Duplicate information from the SPCC Plan may be photocopied and inserted in this section.
1.8.2 Facility Drills/Exercises
(A) CWA section 311(j)(5), as amended by OPA, requires the response plan to contain a description of facility drills/exercises. According to 40 CFR 112.21(c), the facility owner or operator shall develop a program of facility response drills/exercises, including evaluation procedures. Following the PREP guidelines (see Appendix E to this part, section 13, for availability) would satisfy a facility's requirements for drills/exercises under this part. Alternately, under §112.21(c), a facility owner or operator may develop a program that is not based on the PREP guidelines. Such a program is subject to approval by the Regional Administrator based on the description of the program provided in the response plan.
(B) The PREP Guidelines specify that the facility conduct internal and external drills/exercises. The internal exercises include: qualified individual notification drills, spill management team tabletop exercises, equipment deployment exercises, and unannounced exercises. External exercises include Area Exercises. Credit for an Area or Facility-specific Exercise will be given to the facility for an actual response to a discharge in the area if the plan was utilized for response to the discharge and the objectives of the Exercise were met and were properly evaluated, documented, and self-certified.
(C) Section 112.20(h)(8)(ii) requires the facility owner or operator to provide a description of the drill/exercise program to be carried out under the response plan. Qualified Individual Notification Drill and Spill Management Team Tabletop Drill logs shall be provided in sections 1.8.2.1 and 1.8.2.2, respectively. These logs may be included in the facility response plan or kept as an annex to the facility response plan. See section 1.3.3 of this appendix for Equipment Deployment Drill Logs.
1.8.2.1 Qualified Individual Notification Drill Logs
Qualified Individual Notification Drill Log
Date:____________________
Company:____________________
Qualified Individual(s):____________________

Emergency Scenario:_____________________
____
____
Evaluation:_____________________
____
____
____
Changes to be Implemented:_____________________
____
____
Time Table for Implementation:_____________________
____

1.8.2.2 Spill Management Team Tabletop Exercise Logs
Spill Management Team Tabletop Exercise Log
Date:_____________________
Company:_____________________
Qualified Individual(s):_____________________
Emergency Scenario:_____________________
____
____
Evaluation:_____________________
____
____
____
Changes to be Implemented:_____________________
____
____
Time Table for Implementation: _____________________

1.8.3 Response Training
Section 112.21(a) requires facility owners or operators to develop programs for facility response training. Facility owners or operators are required by §112.20(h)(8)(iii) to provide a description of the response training program to be carried out under the response plan. A facility's training program can be based on the USCG's Training Elements for Oil Spill Response, to the extent applicable to facility operations, or another response training program acceptable to the RA. The training elements are available from the USCG Office of Response (G-MOR) at (202) 267–0518 or fax (202) 267–4085. Personnel response training logs and discharge prevention meeting logs shall be included in sections 1.8.3.1 and 1.8.3.2 of the response plan respectively. These logs may be included in the facility response plan or kept as an annex to the facility response plan.
1.8.3.1 Personnel Response Training Logs

Personnel Response Training Log

Name	Response training/ date and number of hours	Prevention training/ date and number of hours

----

1.8.3.2 Discharge Prevention Meetings Logs

Discharge Prevention Meeting Log

Date:_____________________

Attendees:_____________________

____

____

____

____

____

____

____

____

Subject/issue identified   Required action   Implementation date

----

1.9 Diagrams

The facility-specific response plan shall include the following diagrams. Additional diagrams that would aid in the development of response plan sections may also be included.

(1) The Site Plan Diagram shall, as appropriate, include and identify:

(A) the entire facility to scale;

(B) above and below ground bulk oil storage tanks;

(C) the contents and capacities of bulk oil storage tanks;

(D) the contents and capacity of drum oil storage areas;

(E) the contents and capacities of surface impoundments;

(F) process buildings;

(G) transfer areas;

(H) secondary containment systems (location and capacity);

(I) structures where hazardous materials are stored or handled, including materials stored and capacity of storage;

(J) location of communication and emergency response equipment;

(K) location of electrical equipment which contains oil; and

(L) for complexes only, the interface(s) (i.e., valve or component) between the portion of the facility regulated by EPA and the portion(s) regulated by other Agencies. In most cases, this interface is defined as the last valve inside secondary containment before piping leaves the secondary containment area to connect to the transportation-related portion of the facility (i.e., the structure used or intended to be used to transfer oil to or from a vessel or pipeline). In the absence of secondary containment, this interface is the valve manifold adjacent to the tank nearest the transfer structure as described above. The interface may be defined differently at a specific facility if agreed to by the RA and the appropriate Federal official.

(2) The Site Drainage Plan Diagram shall, as appropriate, include:

(A) major sanitary and storm sewers, manholes, and drains;

(B) weirs and shut-off valves;

(C) surface water receiving streams;

(D) fire fighting water sources;

(E) other utilities;

(F) response personnel ingress and egress;

(G) response equipment transportation routes; and

(H) direction of discharge flow from discharge points.

(3) The Site Evacuation Plan Diagram shall, as appropriate, include:

(A) site plan diagram with evacuation route(s); and

(B) location of evacuation regrouping areas.

1.10 Security

According to 40 CFR 112.7(g) facilities are required to maintain a certain level of security, as appropriate. In this section, a description of the facility security shall be provided and include, as appropriate:

(1) emergency cut-off locations (automatic or manual valves);

(2) enclosures (e.g., fencing, etc.);

(3) guards and their duties, day and night;

(4) lighting;
(5) valve and pump locks; and
(6) pipeline connection caps.

The SPCC Plan contains similar information. Duplicate information may be photocopied and inserted in this section.

2.0 Response Plan Cover Sheet

A three-page form has been developed to be completed and submitted to the RA by owners or operators who are required to prepare and submit a facility-specific response plan. The cover sheet (Attachment F–1) must accompany the response plan to provide the Agency with basic information concerning the facility. This section will describe the Response Plan Cover Sheet and provide instructions for its completion.

2.1 General Information

Owner/Operator of Facility: Enter the name of the owner of the facility (if the owner is the operator). Enter the operator of the facility if otherwise. If the owner/operator of the facility is a corporation, enter the name of the facility's principal corporate executive. Enter as much of the name as will fit in each section.

(1) Facility Name: Enter the proper name of the facility.

(2) Facility Address: Enter the street address, city, State, and zip code.

(3) Facility Phone Number: Enter the phone number of the facility.

(4) Latitude and Longitude: Enter the facility latitude and longitude in degrees, minutes, and seconds.

(5) Dun and Bradstreet Number: Enter the facility's Dun and Bradstreet number if available (this information may be obtained from public library resources).

(6) North American Industrial Classification System (NAICS) Code: Enter the facility's NAICS code as determined by the Office of Management and Budget (this information may be obtained from public library resources.)

(7) Largest Oil Storage Tank Capacity: Enter the capacity in GALLONS of the largest aboveground oil storage tank at the facility.

(8) Maximum Oil Storage Capacity: Enter the total maximum capacity in GALLONS of all aboveground oil storage tanks at the facility.

(9) Number of Oil Storage Tanks: Enter the number of all aboveground oil storage tanks at the facility.

(10) Worst Case Discharge Amount: Using information from the worksheets in Appendix D, enter the amount of the worst case discharge in GALLONS.

(11) Facility Distance to Navigable Waters: Mark the appropriate line for the nearest distance between an opportunity for discharge (i.e., oil storage tank, piping, or flowline) and a navigable water.

2.2 Applicability of Substantial Harm Criteria

Using the flowchart provided in Attachment C–I to Appendix C to this part, mark the appropriate answer to each question. Explanations of referenced terms can be found in Appendix C to this part. If a comparable formula to the ones described in Attachment C–III to Appendix C to this part is used to calculate the planning distance, documentation of the reliability and analytical soundness of the formula must be attached to the response plan cover sheet.

2.3 Certification

Complete this block after all other questions have been answered.

3.0 Acronyms

ACP: Area Contingency Plan
ASTM: American Society of Testing Materials
bbls: Barrels
bpd: Barrels per Day
bph: Barrels per Hour
CHRIS: Chemical Hazards Response Information System
CWA: Clean Water Act
DOI: Department of Interior
DOC: Department of Commerce
DOT: Department of Transportation
EPA: Environmental Protection Agency
FEMA: Federal Emergency Management Agency
FR: Federal Register
gal: Gallons
gpm: Gallons per Minute
HAZMAT: Hazardous Materials
LEPC: Local Emergency Planning Committee
MMS: Minerals Management Service (part of DOI)
NAICS: North American Industrial Classification System
NCP: National Oil and Hazardous Substances Pollution Contingency Plan
NOAA: National Oceanic and Atmospheric Administration (part of DOC)
NRC: National Response Center
NRT: National Response Team
OPA: Oil Pollution Act of 1990
OSC: On-Scene Coordinator
PREP: National Preparedness for Response Exercise Program
RA: Regional Administrator
RCRA: Resource Conservation and Recovery Act
RRC: Regional Response Centers
RRT: Regional Response Team
RSPA: Research and Special Programs Administration
SARA: Superfund Amendments and Reauthorization Act
SERC: State Emergency Response Commission
SDWA: Safe Drinking Water Act of 1986
SI: Surface Impoundment
SPCC: Spill Prevention, Control, and Countermeasures
USCG: United States Coast Guard

4.0 References

CONCAWE. 1982. Methodologies for Hazard Analysis and Risk Assessment in the Petroleum Refining and Storage Industry. Prepared by CONCAWE's Risk Assessment Ad-hoc Group.

U.S. Department of Housing and Urban Development. 1987. Siting of HUD-Assisted Projects Near Hazardous Facilities: Acceptable Separation Distances from Explosive and Flammable Hazards. Prepared by the Office of Environment and Energy, Environmental Planning Division, Department of Housing and Urban Development. Washington, DC.

U.S. DOT, FEMA and U.S. EPA. Handbook of Chemical Hazard Analysis Procedures.

U.S. DOT, FEMA and U.S. EPA. Technical Guidance for Hazards Analysis: Emergency Planning for Extremely Hazardous Substances.

The National Response Team. 1987. Hazardous Materials Emergency Planning Guide. Washington, DC.
The National Response Team. 1990. Oil Spill Contingency Planning, National Status: A Report to the President. Washington, DC. U.S. Government Printing Office.
Offshore Inspection and Enforcement Division. 1988. Minerals Management Service, Offshore Inspection Program: National Potential Incident of Noncompliance (PINC) List. Reston, VA.
Attachments to Appendix F
Attachment F–1—Response Plan Cover Sheet
This cover sheet will provide EPA with basic information concerning the facility. It must accompany a submitted facility response plan. Explanations and detailed instructions can be found in Appendix F. Please type or write legibly in blue or black ink. Public reporting burden for the collection of this information is estimated to vary from 1 hour to 270 hours per response in the first year, with an average of 5 hours per response. This estimate includes time for reviewing instructions, searching existing data sources, gathering the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate of this information, including suggestions for reducing this burden to: Chief, Information Policy Branch, Mail Code: PM–2822, U.S. Environmental Protection Agency, Ariel Rios Building, 1200 Pennsylvania Avenue, NW., Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington D.C. 20503.
General Information
Owner/Operator of Facility:
____
Facility Name: _____________________

Facility Address (street address or route):
____
____

City, State, and U.S. Zip Code:
____
Facility Phone No.: _____________________

Latitude (Degrees: North):
____

degrees, minutes, seconds
Dun & Bradstreet Number: 1
1 These numbers may be obtained from public library resources.
____

Largest Aboveground Oil Storage Tank Capacity (Gallons):
____

Number of Aboveground Oil Storage Tanks:
____

Longitude (Degrees: West):

____

degrees, minutes, seconds ____________________
North American Industrial Classification System (NAICS) Code: 1

____

____
Maximum Oil Storage Capacity (Gallons): ____________________
Worst Case Oil Discharge Amount (Gallons): ____________________
Facility Distance to Navigable Water. Mark the appropriate line.

____

0– 1/4 mile __ 1/4– 1/2 mile __ 1/2–1 mile __ >1 mile __
Applicability of Substantial Harm Criteria
Does the facility transfer oil over-water 2 to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?
2 Explanations of the above-referenced terms can be found in Appendix C to this part. If a comparable formula to the ones contained in Attachment C–III is used to establish the appropriate distance to fish and wildlife and sensitive environments or public drinking water intakes, documentation of the reliability and analytical soundness of the formula must be attached to this form.
Yes ____________________
No ____________________

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and, within any storage area, does the facility lack secondary containment 2 that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation?
Yes ____________________
No____________________

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance 2 (as calculated using the appropriate formula in Appendix C or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments? 3
3 For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's "Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments" (see Appendix E to this part, section 13, for availability) and the applicable ACP.
Yes ____________________
No____________________
Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance 2 (as calculated using the appropriate formula in Appendix C or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake? 2 ____________________

Yes ____________________
No ____________________

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil spill 2 in an amount greater than or equal to 10,000 gallons within the last 5 years?
Yes ____________________
No ____________________

Certification
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining information, I believe that the submitted information is true, accurate, and complete.
Signature: ____________________
Name (Please type or print): ____________________
____
Title: ____________________
Date: ____________________

[59 FR 34122, July 1, 1994; 59 FR 49006, Sept. 26, 1994, as amended at 65 FR 40816, June 30, 2000; 65 FR 43840, July 14, 2000; 66 FR 34561, June 29, 2001; 67 FR 47152, July 17, 2002]
Browse Previous | Browse Next

PART 280—TECHNICAL STANDARDS AND CORRECTIVE ACTION REQUIREMENTS FOR OWNERS AND OPERATORS OF UNDERGROUND STORAGE TANKS (UST)

Subpart H—Financial Responsibility

Subpart I—Lender Liability

Authority: 42 U.S.C. 6912, 6991, 6991a, 6991b, 6991c, 6991d, 6991e, 6991f, 6991g, 6991h.

Source: 53 FR 37194, Sept. 23, 1988, unless otherwise noted.

Subpart A—Program Scope and Interim Prohibition

§ 280.10 Applicability.

(a) The requirements of this part apply to all owners and operators of an UST system as defined in §280.12 except as otherwise provided in paragraphs (b), (c), and (d) of this section. Any UST system listed in paragraph (c) of this section must meet the requirements of §280.11.

(b) The following UST systems are excluded from the requirements of this part:

(1) Any UST system holding hazardous wastes listed or identified under Subtitle C of the Solid Waste Disposal Act, or a mixture of such hazardous waste and other regulated substances.

(2) Any wastewater treatment tank system that is part of a wastewater treatment facility regulated under section 402 or 307(b) of the Clean Water Act.

(3) Equipment or machinery that contains regulated substances for operational purposes such as hydraulic lift tanks and electrical equipment tanks.

(4) Any UST system whose capacity is 110 gallons or less.

(5) Any UST system that contains a *de minimis* concentration of regulated substances.

(6) Any emergency spill or overflow containment UST system that is expeditiously emptied after use.

(c) *Deferrals.* Subparts B, C, D, E, and G do not apply to any of the following types of UST systems:

(1) Wastewater treatment tank systems;

(2) Any UST systems containing radioactive material that are regulated under the Atomic Energy Act of 1954 (42 U.S.C. 2011 and following);

(3) Any UST system that is part of an emergency generator system at nuclear power generation facilities regulated by the Nuclear Regulatory Commission under 10 CFR part 50, appendix A;

(4) Airport hydrant fuel distribution systems; and

(5) UST systems with field-constructed tanks.

(d) *Deferrals.* Subpart D does not apply to any UST system that stores fuel solely for use by emergency power generators.

§ 280.11 Interim prohibition for deferred UST systems.

(a) No person may install an UST system listed in §280.10(c) for the purpose of storing regulated substances unless the UST system (whether of single- or double-wall construction):

(1) Will prevent releases due to corrosion or structural failure for the operational life of the UST system;

(2) Is cathodically protected against corrosion, constructed of noncorrodible material, steel clad with a noncorrodible material, or designed in a manner to prevent the release or threatened release of any stored substance; and

(3) Is constructed or lined with material that is compatible with the stored substance.

(b) Notwithstanding paragraph (a) of this section, an UST system without corrosion protection may be installed at a site that is determined by a corrosion expert not to be corrosive enough to cause it to have a release due to corrosion during its operating life. Owners and operators must maintain records that demonstrate compliance with the requirements of this paragraph for the remaining life of the tank.

Note: The National Association of Corrosion Engineers Standard RP–02–85, "Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems," may be used as guidance for complying with paragraph (b) of this section.

§ 280.12 Definitions.

Aboveground release means any release to the surface of the land or to surface water. This includes, but is not limited to, releases from the above-ground portion of an UST system and aboveground releases associated with overfills and transfer operations as the regulated substance moves to or from an UST system.

Ancillary equipment means any devices including, but not limited to, such devices as piping, fittings, flanges, valves, and pumps used to distribute, meter, or control the flow of regulated substances to and from an UST.

Belowground release means any release to the subsurface of the land and to ground water. This includes, but is not limited to, releases from the belowground portions of an underground storage tank system and belowground releases associated with overfills and transfer operations as the regulated substance moves to or from an underground storage tank.

Beneath the surface of the ground means beneath the ground surface or otherwise covered with earthen materials.

Cathodic protection is a technique to prevent corrosion of a metal surface by making that surface the cathode of an electrochemical cell. For example, a tank system can be cathodically protected through the application of either galvanic anodes or impressed current.

Cathodic protection tester means a person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. At a minimum, such persons must have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems.

CERCLA means the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended.

Compatible means the ability of two or more substances to maintain their respective physical and chemical properties upon contact with one another for the design life of the tank system under conditions likely to be encountered in the UST.

Connected piping means all underground piping including valves, elbows, joints, flanges, and flexible connectors attached to a tank system through which regulated substances flow. For the purpose of determining how much piping is connected to any individual UST system, the piping that joins two UST systems should be allocated equally between them.

Consumptive use with respect to heating oil means consumed on the premises.

Corrosion expert means a person who, by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on buried or submerged metal piping systems and metal tanks. Such a person must be accredited or certified as being qualified by the National Association of Corrosion Engineers or be a registered professional engineer who has certification or licensing that includes education and experience in corrosion control of buried or submerged metal piping systems and metal tanks.

Dielectric material means a material that does not conduct direct electrical current. Dielectric coatings are used to electrically isolate UST systems from the surrounding soils. Dielectric bushings are used to electrically isolate portions of the UST system (e.g., tank from piping).

Electrical equipment means underground equipment that contains dielectric fluid that is necessary for the operation of equipment such as transformers and buried electrical cable.

Excavation zone means the volume containing the tank system and backfill material bounded by the ground surface, walls, and floor of the pit and trenches into which the UST system is placed at the time of installation.

Existing tank system means a tank system used to contain an accumulation of regulated substances or for which installation has commenced on or before December 22, 1988. Installation is considered to have commenced if:

(a) The owner or operator has obtained all federal, state, and local approvals or permits necessary to begin physical construction of the site or installation of the tank system; and if,

(b)(1) Either a continuous on-site physical construction or installation program has begun; or,

(2) The owner or operator has entered into contractual obligations—which cannot be cancelled or modified without substantial loss—for physical construction at the site or installation of the tank system to be completed within a reasonable time.

Farm tank is a tank located on a tract of land devoted to the production of crops or raising animals, including fish, and associated residences and improvements. A farm tank must be located on the farm property. “Farm” includes fish hatcheries, rangeland and nurseries with growing operations.

Flow-through process tank is a tank that forms an integral part of a production process through which there is a steady, variable, recurring, or intermittent flow of materials during the operation of the process. Flow-through process tanks do not include tanks used for the storage of materials prior to their introduction into the production process or for the storage of finished products or by-products from the production process.

Free product refers to a regulated substance that is present as a non-aqueous phase liquid (e.g., liquid not dissolved in water.)

Gathering lines means any pipeline, equipment, facility, or building used in the transportation of oil or gas during oil or gas production or gathering operations.

Hazardous substance UST system means an underground storage tank system that contains a hazardous substance defined in section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (but not including any substance regulated as a hazardous waste under subtitle C) or any mixture of such substances and petroleum, and which is not a petroleum UST system.

Heating oil means petroleum that is No. 1, No. 2, No. 4—light, No. 4—heavy, No. 5—light, No. 5—heavy, and No. 6 technical grades of fuel oil; other residual fuel oils (including Navy Special Fuel Oil and Bunker C); and other fuels when used as substitutes for one of these fuel oils. Heating oil is typically used in the operation of heating equipment, boilers, or furnaces.

Hydraulic lift tank means a tank holding hydraulic fluid for a closed-loop mechanical system that uses compressed air or hydraulic fluid to operate lifts, elevators, and other similar devices.

Implementing agency means EPA, or, in the case of a state with a program approved under section 9004 (or pursuant to a memorandum of agreement with EPA), the designated state or local agency responsible for carrying out an approved UST program.

Liquid trap means sumps, well cellars, and other traps used in association with oil and gas production, gathering, and extraction operations (including gas production plants), for the purpose of collecting oil, water, and other liquids. These liquid traps may temporarily collect liquids for subsequent disposition or reinjection into a production or pipeline stream, or may collect and separate liquids from a gas stream.

Maintenance means the normal operational upkeep to prevent an underground storage tank system from releasing product.

Motor fuel means petroleum or a petroleum-based substance that is motor gasoline, aviation gasoline, No. 1 or No. 2 diesel fuel, or any grade of gasohol, and is typically used in the operation of a motor engine.

New tank system means a tank system that will be used to contain an accumulation of regulated substances and for which installation has commenced after December 22, 1988. (See also "Existing Tank System.")

Noncommercial purposes with respect to motor fuel means not for resale.

On the premises where stored with respect to heating oil means UST systems located on the same property where the stored heating oil is used.

Operational life refers to the period beginning when installation of the tank system has commenced until the time the tank system is properly closed under Subpart G.

Operator means any person in control of, or having responsibility for, the daily operation of the UST system.

Overfill release is a release that occurs when a tank is filled beyond its capacity, resulting in a discharge of the regulated substance to the environment.

Owner means:

(a) In the case of an UST system in use on November 8, 1984, or brought into use after that date, any person who owns an UST system used for storage, use, or dispensing of regulated substances; and

(b) In the case of any UST system in use before November 8, 1984, but no longer in use on that date, any person who owned such UST immediately before the discontinuation of its use.

Person means an individual, trust, firm, joint stock company, Federal agency, corporation, state, municipality, commission, political subdivision of a state, or any interstate body. “Person” also includes a consortium, a joint venture, a commercial entity, and the United States Government.

Petroleum UST system means an underground storage tank system that contains petroleum or a mixture of petroleum with *de minimis* quantities of other regulated substances. Such systems include those containing motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

Pipe or *Piping* means a hollow cylinder or tubular conduit that is constructed of non-earthen materials.

Pipeline facilities (including gathering lines) are new and existing pipe rights-of-way and any associated equipment, facilities, or buildings.

Regulated substance means:

(a) Any substance defined in section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 (but not including any substance regulated as a hazardous waste under subtitle C), and

(b) Petroleum, including crude oil or any fraction thereof that is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute).

The term “regulated substance” includes but is not limited to petroleum and petroleum-based substances comprised of a complex blend of hydrocarbons derived from crude oil though processes of separation, conversion, upgrading, and finishing, such as motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

Release means any spilling, leaking, emitting, discharging, escaping, leaching or disposing from an UST into ground water, surface water or subsurface soils.

Release detection means determining whether a release of a regulated substance has occurred from the UST system into the environment or into the interstitial space between the UST system and its secondary barrier or secondary containment around it.

Repair means to restore a tank or UST system component that has caused a release of product from the UST system.

Residential tank is a tank located on property used primarily for dwelling purposes.

SARA means the Superfund Amendments and Reauthorization Act of 1986.

Septic tank is a water-tight covered receptacle designed to receive or process, through liquid separation or biological digestion, the sewage discharged from a building sewer. The effluent from such receptacle is distributed for disposal through the soil and settled solids and scum from the tank are pumped out periodically and hauled to a treatment facility.

Storm-water or wastewater collection system means piping, pumps, conduits, and any other equipment necessary to collect and transport the flow of surface water run-off resulting from precipitation, or domestic, commercial, or industrial wastewater to and from retention areas or any areas where treatment is designated to occur. The collection of storm water and wastewater does not include treatment except where incidental to conveyance.

Surface impoundment is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials) that is not an injection well.

Tank is a stationary device designed to contain an accumulation of regulated substances and constructed of non-earthen materials (e.g., concrete, steel, plastic) that provide structural support.

Underground area means an underground room, such as a basement, cellar, shaft or vault, providing enough space for physical inspection of the exterior of the tank situated on or above the surface of the floor.

Underground release means any belowground release.

Underground storage tank or *UST* means any one or combination of tanks (including underground pipes connected thereto) that is used to contain an accumulation of regulated substances, and the volume of which (including the volume of underground pipes connected thereto) is 10 percent or more beneath the surface of the ground. This term does not include any:

(a) Farm or residential tank of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;

(b) Tank used for storing heating oil for consumptive use on the premises where stored;

(c) Septic tank;

(d) Pipeline facility (including gathering lines) regulated under:

(1) The Natural Gas Pipeline Safety Act of 1968 (49 U.S.C. App. 1671, *et seq.*), or

(2) The Hazardous Liquid Pipeline Safety Act of 1979 (49 U.S.C. App. 2001, *et seq.*), or

(3) Which is an intrastate pipeline facility regulated under state laws comparable to the provisions of the law referred to in paragraph (d)(1) or (d)(2) of this definition;

(e) Surface impoundment, pit, pond, or lagoon;

(f) Storm-water or wastewater collection system;

(g) Flow-through process tank;

(h) Liquid trap or associated gathering lines directly related to oil or gas production and gathering operations; or

(i) Storage tank situated in an underground area (such as a basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

The term “underground storage tank” or “UST” does not include any pipes connected to any tank which is described in paragraphs (a) through (i) of this definition.

Upgrade means the addition or retrofit of some systems such as cathodic protection, lining, or spill and overfill controls to improve the ability of an underground storage tank system to prevent the release of product.

UST system or *Tank system* means an underground storage tank, connected underground piping, underground ancillary equipment, and containment system, if any.

Wastewater treatment tank means a tank that is designed to receive and treat an influent wastewater through physical, chemical, or biological methods.

Subpart B—UST Systems: Design, Construction, Installation and Notification

§ 280.20 Performance standards for new UST systems.

In order to prevent releases due to structural failure, corrosion, or spills and overfills for as long as the UST system is used to store regulated substances, all owners and operators of new UST systems must meet the following requirements.

(a) *Tanks.* Each tank must be properly designed and constructed, and any portion underground that routinely contains product must be protected from corrosion, in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory as specified below:

(1) The tank is constructed of fiberglass-reinforced plastic; or

Note: The following industry codes may be used to comply with paragraph (a)(1) of this section: Underwriters Laboratories Standard 1316, “Standard for Glass- Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products”; Underwriter's Laboratories of Canada CAN4–S615–M83, “Standard for Reinforced Plastic Underground Tanks for Petroleum Products”; or American Society of Testing and Materials Standard D4021–86, “Standard Specification for Glass-Fiber-Reinforced Polyester Underground Petroleum Storage Tanks.”

(2) The tank is constructed of steel and cathodically protected in the following manner:

(i) The tank is coated with a suitable dielectric material;

(ii) Field-installed cathodic protection systems are designed by a corrosion expert;

(iii) Impressed current systems are designed to allow determination of current operating status as required in §280.31(c); and

(iv) Cathodic protection systems are operated and maintained in accordance with §280.31 or according to guidelines established by the implementing agency; or

Note: The following codes and standards may be used to comply with paragraph (a)(2) of this section:

(A) Steel Tank Institute “Specification for STI-P3 System of External Corrosion Protection of Underground Steel Storage Tanks”;

(B) Underwriters Laboratories Standard 1746, “Corrosion Protection Systems for Underground Storage Tanks”;

(C) Underwriters Laboratories of Canada CAN4–S603–M85, “Standard for Steel Underground Tanks for Flammable and Combustible Liquids,” and CAN4–G03.1–M85, “Standard for Galvanic Corrosion Protection Systems for Underground Tanks for Flammable and Combustible Liquids,” and CAN4–S631–M84, “Isolating Bushings for Steel Underground Tanks Protected with Coatings and Galvanic Systems”; or

(D) National Association of Corrosion Engineers Standard RP–02–85, “Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems,” and Underwriters Laboratories Standard 58, “Standard for Steel Underground Tanks for Flammable and Combustible Liquids.”

(3) The tank is constructed of a steel-fiberglass-reinforced-plastic composite; or

Note: The following industry codes may be used to comply with paragraph (a)(3) of this section: Underwriters Laboratories Standard 1746, “Corrosion Protection Systems for Underground Storage Tanks,” or the Association for Composite Tanks ACT–100, “Specification for the Fabrication of FRP Clad Underground Storage Tanks.”

(4) The tank is constructed of metal without additional corrosion protection measures provided that:

(i) The tank is installed at a site that is determined by a corrosion expert not to be corrosive enough to cause it to have a release due to corrosion during its operating life; and

(ii) Owners and operators maintain records that demonstrate compliance with the requirements of paragraphs (a)(4)(i) for the remaining life of the tank; or

(5) The tank construction and corrosion protection are determined by the implementing agency to be designed to prevent the release or threatened release of any stored regulated substance in a manner that is no less protective of human health and the environment than paragraphs (a) (1) through (4) of this section.

(b) *Piping.* The piping that routinely contains regulated substances and is in contact with the ground must be properly designed, constructed, and protected from corrosion in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory as specified below:

(1) The piping is constructed of fiberglass-reinforced plastic; or

Note: The following codes and standards may be used to comply with paragraph (b)(1) of this section:

(A) Underwriters Laboratories Subject 971, “UL Listed Non-Metal Pipe”;

(B) Underwriters Laboratories Standard 567, “Pipe Connectors for Flammable and Combustible and LP Gas”;

(C) Underwriters Laboratories of Canada Guide ULC–107, “Glass Fiber Reinforced Plastic Pipe and Fittings for Flammable Liquids”; and

(D) Underwriters Laboratories of Canada Standard CAN 4–S633–M81, “Flexible Underground Hose Connectors.”

(2) The piping is constructed of steel and cathodically protected in the following manner:

(i) The piping is coated with a suitable dielectric material;

(ii) Field-installed cathodic protection systems are designed by a corrosion expert;

(iii) Impressed current systems are designed to allow determination of current operating status as required in §280.31(c); and

(iv) Cathodic protection systems are operated and maintained in accordance with §280.31 or guidelines established by the implementing agency; or

Note: The following codes and standards may be used to comply with paragraph (b)(2) of this section:

(A) National Fire Protection Association Standard 30, “Flammable and Combustible Liquids Code”;

(B) American Petroleum Institute Publication 1615, “Installation of Underground Petroleum Storage Systems”;

(C) American Petroleum Institute Publication 1632, “Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems”; and

(D) National Association of Corrosion Engineers Standard RP–01–69, “Control of External Corrosion on Submerged Metallic Piping Systems.”

(3) The piping is constructed of metal without additional corrosion protection measures provided that:

(i) The piping is installed at a site that is determined by a corrosion expert to not be corrosive enough to cause it to have a release due to corrosion during its operating life; and

(ii) Owners and operators maintain records that demonstrate compliance with the requirements of paragraph (b)(3)(i) of this section for the remaining life of the piping; or

Note: National Fire Protection Association Standard 30, “Flammable and Combustible Liquids Code”; and National Association of Corrosion Engineers Standard RP–01–69, “Control of

External Corrosion on Submerged Metallic Piping Systems,” may be used to comply with paragraph (b)(3) of this section.

(4) The piping construction and corrosion protection are determined by the implementing agency to be designed to prevent the release or threatened release of any stored regulated substance in a manner that is no less protective of human health and the environment than the requirements in paragraphs (b) (1) through (3) of this section.

(c) *Spill and overfill prevention equipment.* (1) Except as provided in paragraph (c)(2) of this section, to prevent spilling and overfilling associated with product transfer to the UST system, owners and operators must use the following spill and overfill prevention equipment:

(i) Spill prevention equipment that will prevent release of product to the environment when the transfer hose is detached from the fill pipe (for example, a spill catchment basin); and

(ii) Overfill prevention equipment that will:

(A) Automatically shut off flow into the tank when the tank is no more than 95 percent full; or

(B) Alert the transfer operator when the tank is no more than 90 percent full by restricting the flow into the tank or triggering a high-level alarm; or

(C) Restrict flow 30 minutes prior to overfilling, alert the operator with a high level alarm one minute before overfilling, or automatically shut off flow into the tank so that none of the fittings located on top of the tank are exposed to product due to overfilling.

(2) Owners and operators are not required to use the spill and overfill prevention equipment specified in paragraph (c)(1) of this section if:

(i) Alternative equipment is used that is determined by the implementing agency to be no less protective of human health and the environment than the equipment specified in paragraph (c)(1) (i) or (ii) of this section; or

(ii) The UST system is filled by transfers of no more than 25 gallons at one time.

(d) *Installation.* All tanks and piping must be properly installed in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory and in accordance with the manufacturer's instructions.

Note: Tank and piping system installation practices and procedures described in the following codes may be used to comply with the requirements of paragraph (d) of this section:

(i) American Petroleum Institute Publication 1615, “Installation of Underground Petroleum Storage System”; or

(ii) Petroleum Equipment Institute Publication RP100, “Recommended Practices for Installation of Underground Liquid Storage Systems”; or

(iii) American National Standards Institute Standard B31.3, “Petroleum Refinery Piping,” and American National Standards Institute Standard B31.4 “Liquid Petroleum Transportation Piping System.”

(e) *Certification of installation.* All owners and operators must ensure that one or more of the following methods of certification, testing, or inspection is used to demonstrate compliance with paragraph (d) of this section by providing a certification of compliance on the UST notification form in accordance with §280.22.

(1) The installer has been certified by the tank and piping manufacturers; or

(2) The installer has been certified or licensed by the implementing agency; or

(3) The installation has been inspected and certified by a registered professional engineer with education and experience in UST system installation; or

(4) The installation has been inspected and approved by the implementing agency; or

(5) All work listed in the manufacturer's installation checklists has been completed; or

(6) The owner and operator have complied with another method for ensuring compliance with paragraph (d) of this section that is determined by the implementing agency to be no less protective of human health and the environment.

[53 FR 37194, Sept. 23, 1988, as amended at 56 FR 38344, Aug. 13, 1991]

§ 280.21 Upgrading of existing UST systems.

(a) *Alternatives allowed.* Not later than December 22, 1998, all existing UST systems must comply with one of the following requirements:

(1) New UST system performance standards under §280.20;

(2) The upgrading requirements in paragraphs (b) through (d) of this section; or

(3) Closure requirements under subpart G of this part, including applicable requirements for corrective action under subpart F.

(b) *Tank upgrading requirements.* Steel tanks must be upgraded to meet one of the following requirements in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory:

(1) *Interior lining.* A tank may be upgraded by internal lining if:

(i) The lining is installed in accordance with the requirements of §280.33, and

(ii) Within 10 years after lining, and every 5 years thereafter, the lined tank is internally inspected and found to be structurally sound with the lining still performing in accordance with original design specifications.

(2) *Cathodic protection.* A tank may be upgraded by cathodic protection if the cathodic protection system meets the requirements of §280.20(a)(2) (ii), (iii), and (iv) and the integrity of the tank is ensured using one of the following methods:

(i) The tank is internally inspected and assessed to ensure that the tank is structurally sound and free of corrosion holes prior to installing the cathodic protection system; or

(ii) The tank has been installed for less than 10 years and is monitored monthly for releases in accordance with §280.43 (d) through (h); or

(iii) The tank has been installed for less than 10 years and is assessed for corrosion holes by conducting two (2) tightness tests that meet the requirements of §280.43(c). The first tightness test must be conducted prior to installing the cathodic protection system. The second tightness test must be conducted between three (3) and six (6) months following the first operation of the cathodic protection system; or

(iv) The tank is assessed for corrosion holes by a method that is determined by the implementing agency to prevent releases in a manner that is no less protective of human health and the environment than paragraphs (b)(2) (i) through (iii) of this section.

(3) *Internal lining combined with cathodic protection.* A tank may be upgraded by both internal lining and cathodic protection if:

(i) The lining is installed in accordance with the requirements of §280.33; and

(ii) The cathodic protection system meets the requirements of §280.20(a)(2) (ii), (iii), and (iv).

Note: The following codes and standards may be used to comply with this section:

(A) American Petroleum Institute Publication 1631, “Recommended Practice for the Interior Lining of Existing Steel Underground Storage Tanks”;

(B) National Leak Prevention Association Standard 631, “Spill Prevention, Minimum 10 Year Life Extension of Existing Steel Underground Tanks by Lining Without the Addition of Cathodic Protection”;

(C) National Association of Corrosion Engineers Standard RP–02–85, “Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems”; and

(D) American Petroleum Institute Publication 1632, “Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems.”

(c) *Piping upgrading requirements.* Metal piping that routinely contains regulated substances and is in contact with the ground must be cathodically protected in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory and must meet the requirements of §280.20(b)(2) (ii), (iii), and (iv).

Note: The codes and standards listed in the note following §280.20(b)(2) may be used to comply with this requirement.

(d) *Spill and overfill prevention equipment.* To prevent spilling and overfilling associated with product transfer to the UST system, all existing UST systems must comply with new UST system spill and overfill prevention equipment requirements specified in §280.20(c).

§ 280.22 Notification requirements.

(a) Any owner who brings an underground storage tank system into use after May 8, 1986, must within 30 days of bringing such tank into use, submit, in the form prescribed in appendix I of this part, a notice of existence of such tank system to the state or local agency or department designated in appendix II of this part to receive such notice.

Note: Owners and operators of UST systems that were in the ground on or after May 8, 1986, unless taken out of operation on or before January 1, 1974, were required to notify the designated state or local agency in accordance with the Hazardous and Solid Waste Amendments of 1984, Pub. L. 98–616, on a form published by EPA on November 8, 1985 (50 FR 46602) unless notice was given pursuant to section 103(c) of CERCLA. Owners and operators who have not complied with the notification requirements may use portions I through VI of the notification form contained in appendix I of this part.

(b) In states where state law, regulations, or procedures require owners to use forms that differ from those set forth in appendix I of this part to fulfill the requirements of this section, the state forms may be submitted in lieu of the forms set forth in Appendix I of this part. If a state requires that its form be used in lieu of the form presented in this regulation, such form must meet the requirements of section 9002.

(c) Owners required to submit notices under paragraph (a) of this section must provide notices to the appropriate agencies or departments identified in appendix II of this part for each tank they own. Owners may provide notice for several tanks using one notification form, but owners who own tanks located at more than one place of operation must file a separate notification form for each separate place of operation.

(d) Notices required to be submitted under paragraph (a) of this section must provide all of the information in sections I through VI of the prescribed form (or appropriate state form) for each tank for which notice must be given. Notices for tanks installed after December 22, 1988 must also provide all of the information in section VII of the prescribed form (or appropriate state form) for each tank for which notice must be given.

(e) All owners and operators of new UST systems must certify in the notification form compliance with the following requirements:

(1) Installation of tanks and piping under §280.20(e);

(2) Cathodic protection of steel tanks and piping under §280.20 (a) and (b);

(3) Financial responsibility under subpart H of this part; and

(4) Release detection under §§280.41 and 280.42.

(f) All owners and operators of new UST systems must ensure that the installer certifies in the notification form that the methods used to install the tanks and piping complies with the requirements in §280.20(d).

(g) Beginning October 24, 1988, any person who sells a tank intended to be used as an underground storage tank must notify the purchaser of such tank of the owner's notification obligations under paragraph (a) of this section. The form provided in appendix III of this part may be used to comply with this requirement.

Subpart C—General Operating Requirements

§ 280.30 Spill and overfill control.

(a) Owners and operators must ensure that releases due to spilling or overfilling do not occur. The owner and operator must ensure that the volume available in the tank is greater than the volume of product to be transferred to the tank before the transfer is made and that the transfer operation is monitored constantly to prevent overfilling and spilling.

Note: The transfer procedures described in National Fire Protection Association Publication 385 may be used to comply with paragraph (a) of this section. Further guidance on spill and overfill prevention appears in American Petroleum Institute Publication 1621, “Recommended Practice for Bulk Liquid Stock Control at Retail Outlets,” and National Fire Protection Association Standard 30, “Flammable and Combustible Liquids Code.”

(b) The owner and operator must report, investigate, and clean up any spills and overfills in accordance with §280.53.

§ 280.31 Operation and maintenance of corrosion protection.

All owners and operators of steel UST systems with corrosion protection must comply with the following requirements to ensure that releases due to corrosion are prevented for as long as the UST system is used to store regulated substances:

(a) All corrosion protection systems must be operated and maintained to continuously provide corrosion protection to the metal components of that portion of the tank and piping that routinely contain regulated substances and are in contact with the ground.

(b) All UST systems equipped with cathodic protection systems must be inspected for proper operation by a qualified cathodic protection tester in accordance with the following requirements:

(1) *Frequency.* All cathodic protection systems must be tested within 6 months of installation and at least every 3 years thereafter or according to another reasonable time frame established by the implementing agency; and

(2) *Inspection criteria.* The criteria that are used to determine that cathodic protection is adequate as required by this section must be in accordance with a code of practice developed by a nationally recognized association.

Note: National Association of Corrosion Engineers Standard RP–02–85, “Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems,” may be used to comply with paragraph (b)(2) of this section.

(c) UST systems with impressed current cathodic protection systems must also be inspected every 60 days to ensure the equipment is running properly.

(d) For UST systems using cathodic protection, records of the operation of the cathodic protection must be maintained (in accordance with §280.34) to demonstrate compliance with the performance standards in this section. These records must provide the following:

(1) The results of the last three inspections required in paragraph (c) of this section; and

(2) The results of testing from the last two inspections required in paragraph (b) of this section.

§ 280.32   Compatibility.

Owners and operators must use an UST system made of or lined with materials that are compatible with the substance stored in the UST system.

Note: Owners and operators storing alcohol blends may use the following codes to comply with the requirements of this section:

(a) American Petroleum Institute Publication 1626, “Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Service Stations”; and

(b) American Petroleum Institute Publication 1627, “Storage and Handling of Gasoline-Methanol/Cosolvent Blends at Distribution Terminals and Service Stations.”

§ 280.33   Repairs allowed.

Owners and operators of UST systems must ensure that repairs will prevent releases due to structural failure or corrosion as long as the UST system is used to store regulated substances. The repairs must meet the following requirements:

(a) Repairs to UST systems must be properly conducted in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory.

Note: The following codes and standards may be used to comply with paragraph (a) of this section: National Fire Protection Association Standard 30, “Flammable and Combustible Liquids Code”; American Petroleum Institute Publication 2200, “Repairing Crude Oil, Liquified Petroleum

Gas, and Product Pipelines”; American Petroleum Institute Publication 1631, “Recommended Practice for the Interior Lining of Existing Steel Underground Storage Tanks”; and National Leak Prevention Association Standard 631, “Spill Prevention, Minimum 10 Year Life Extension of Existing Steel Underground Tanks by Lining Without the Addition of Cathodic Protection.”

(b) Repairs to fiberglass-reinforced plastic tanks may be made by the manufacturer's authorized representatives or in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory.

(c) Metal pipe sections and fittings that have released product as a result of corrosion or other damage must be replaced. Fiberglass pipes and fittings may be repaired in accordance with the manufacturer's specifications.

(d) Repaired tanks and piping must be tightness tested in accordance with §280.43(c) and §280.44(b) within 30 days following the date of the completion of the repair except as provided in paragraphs (d) (1) through (3), of this section:

(1) The repaired tank is internally inspected in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory; or

(2) The repaired portion of the UST system is monitored monthly for releases in accordance with a method specified in §280.43 (d) through (h); or

(3) Another test method is used that is determined by the implementing agency to be no less protective of human health and the environment than those listed above.

(e) Within 6 months following the repair of any cathodically protected UST system, the cathodic protection system must be tested in accordance with §280.31 (b) and (c) to ensure that it is operating properly.

(f) UST system owners and operators must maintain records of each repair for the remaining operating life of the UST system that demonstrate compliance with the requirements of this section.

§ 280.34 Reporting and recordkeeping.

Owners and operators of UST systems must cooperate fully with inspections, monitoring and testing conducted by the implementing agency, as well as requests for document submission, testing, and monitoring by the owner or operator pursuant to section 9005 of Subtitle I of the Resource Conservation and Recovery Act, as amended.

(a) *Reporting.* Owners and operators must submit the following information to the implementing agency:

(1) Notification for all UST systems (§280.22), which includes certification of installation for new UST systems (§280.20(e)),

(2) Reports of all releases including suspected releases (§280.50), spills and overfills (§280.53), and confirmed releases (§280.61);

(3) Corrective actions planned or taken including initial abatement measures (§280.62), initial site characterization (§280.63), free product removal (§280.64), investigation of soil and ground-water cleanup (§280.65), and corrective action plan (§280.66); and

(4) A notification before permanent closure or change-in-service (§280.71).

(b) *Recordkeeping.* Owners and operators must maintain the following information:

(1) A corrosion expert's analysis of site corrosion potential if corrosion protection equipment is not used (§280.20(a)(4); §280.20(b)(3)).

(2) Documentation of operation of corrosion protection equipment (§280.31);

(3) Documentation of UST system repairs (§280.33(f));

(4) Recent compliance with release detection requirements (§280.45); and

(5) Results of the site investigation conducted at permanent closure (§280.74).

(c) *Availability and Maintenance of Records.* Owners and operators must keep the records required either:

(1) At the UST site and immediately available for inspection by the implementing agency; or

(2) At a readily available alternative site and be provided for inspection to the implementing agency upon request.

(3) In the case of permanent closure records required under §280.74, owners and operators are also provided with the additional alternative of mailing closure records to the implementing agency if they cannot be kept at the site or an alternative site as indicated above.

Subpart D—Release Detection

§ 280.40 General requirements for all UST systems.

(a) Owners and operators of new and existing UST systems must provide a method, or combination of methods, of release detection that:

(1) Can detect a release from any portion of the tank and the connected underground piping that routinely contains product;

(2) Is installed, calibrated, operated, and maintained in accordance with the manufacturer's instructions, including routine maintenance and service checks for operability or running condition; and

(3) Meets the performance requirements in §280.43 or 280.44, with any performance claims and their manner of determination described in writing by the equipment manufacturer or installer. In addition, methods used after the date shown in the following table corresponding with the specified method except for methods permanently installed prior to that date, must be capable of detecting the leak rate or quantity specified for that method in the corresponding section of the rule (also shown in the table) with a probability of detection (Pd) of 0.95 and a probability of false alarm (Pfa) of 0.05.

Method	Section	Date after which Pd/Pfa must be demonstrated
Manual Tank Gauging	280.43(b)	December 22, 1990.
Tank Tightness Testing	280.43(c)	December 22, 1990.
Automatic Tank Gauging	280.43(d)	December 22, 1990.
Automatic Line Leak Detectors	280.44(a)	September 22, 1991.
Line Tightness Testing	280.44(b)	December 22, 1990.

(b) When a release detection method operated in accordance with the performance standards in §280.43 and §280.44 indicates a release may have occurred, owners and operators must notify the implementing agency in accordance with subpart E.

(c) Owners and operators of all UST systems must comply with the release detection requirements of this subpart by December 22 of the year listed in the following table:

Schedule for Phase-in of Release Detection

Year system was installed	Year when release detection is required (by December 22 of the year indicated)				
	1989	1990	1991	1992	1993
Before 1965 or date unknown	RD	P			
1965–69		P/RD			
1970–74		P	RD		
1975–79		P		RD	
1980–88		P			RD
New tanks (after December 22) immediately upon installation.					

P=Must begin release detection for all pressurized piping as defined in §280.41(b)(1).

RD=Must begin release detection for tanks and suction piping in accordance with §280.41(a), §280.41(b)(2), and §280.42.

(d) Any existing UST system that cannot apply a method of release detection that complies with the requirements of this subpart must complete the closure procedures in subpart G by the date on which release detection is required for that UST system under paragraph (c) of this section.

[53 FR 37194, Sept. 23, 1988, as amended at 55 FR 17753, Apr. 27, 1990; 55 FR 23738, June 12, 1990; 56 FR 26, Jan. 2, 1991]

§ 280.41   Requirements for petroleum UST systems.

Owners and operators of petroleum UST systems must provide release detection for tanks and piping as follows:

(a) *Tanks.* Tanks must be monitored at least every 30 days for releases using one of the methods listed in §280.43 (d) through (h) except that:

(1) UST systems that meet the performance standards in §280.20 or §280.21, and the monthly inventory control requirements in §280.43 (a) or (b), may use tank tightness testing (conducted in accordance with §280.43(c)) at least every 5

years until December 22, 1998, or until 10 years after the tank is installed or upgraded under §280.21(b), whichever is later;

(2) UST systems that do not meet the performance standards in §280.20 or §280.21 may use monthly inventory controls (conducted in accordance with §280.43(a) or (b)) and annual tank tightness testing (conducted in accordance with §280.43(c)) until December 22, 1998 when the tank must be upgraded under §280.21 or permanently closed under §280.71; and

(3) Tanks with capacity of 550 gallons or less may use weekly tank gauging (conducted in accordance with §280.43(b)).

(b) *Piping.* Underground piping that routinely contains regulated substances must be monitored for releases in a manner that meets one of the following requirements:

(1) *Pressurized piping.* Underground piping that conveys regulated substances under pressure must:

(i) Be equipped with an automatic line leak detector conducted in accordance with §280.44(a); and

(ii) Have an annual line tightness test conducted in accordance with §280.44(b) or have monthly monitoring conducted in accordance with §280.44(c).

(2) *Suction piping.* Underground piping that conveys regulated substances under suction must either have a line tightness test conducted at least every 3 years and in accordance with §280.44(b), or use a monthly monitoring method conduct in accordance with §280.44(c). No release detection is required for suction piping that is designed and constructed to meet the following standards:

(i) The below-grade piping operates at less than atmospheric pressure;

(ii) The below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if the suction is released;

(iii) Only one check valve is included in each suction line;

(iv) The check valve is located directly below and as close as practical to the suction pump; and

(v) A method is provided that allows compliance with paragraphs (b)(2) (ii)–(iv) of this section to be readily determined.

§ 280.42 Requirements for hazardous substance UST systems.

Owners and operators of hazardous substance UST systems must provide release detection that meets the following requirements:

(a) Release detection at existing UST systems must meet the requirements for petroleum UST systems in §280.41. By December 22, 1998, all existing hazardous substance UST systems must meet the release detection requirements for new systems in paragraph (b) of this section.

(b) Release detection at new hazardous substance UST systems must meet the following requirements:

(1) Secondary containment systems must be designed, constructed and installed to:

(i) Contain regulated substances released from the tank system until they are detected and removed;

(ii) Prevent the release of regulated substances to the environment at any time during the operational life of the UST system; and

(iii) Be checked for evidence of a release at least every 30 days.

Note. The provisions of 40 CFR 265.193, Containment and Detection of Releases, may be used to comply with these requirements.

(2) Double-walled tanks must be designed, constructed, and installed to:

(i) Contain a release from any portion of the inner tank within the outer wall; and

(ii) Detect the failure of the inner wall.

(3) External liners (including vaults) must be designed, constructed, and installed to:

(i) Contain 100 percent of the capacity of the largest tank within its boundary;

(ii) Prevent the interference of precipitation or ground-water intrusion with the ability to contain or detect a release of regulated substances; and

(iii) Surround the tank completely (i.e., it is capable of preventing lateral as well as vertical migration of regulated substances).

(4) Underground piping must be equipped with secondary containment that satisfies the requirements of paragraph (b)(1) of this section (e.g., trench liners, jacketing of double-walled pipe). In addition, underground piping that conveys

regulated substances under pressure must be equipped with an automatic line leak detector in accordance with §280.44(a).

(5) Other methods of release detection may be used if owners and operators:

(i) Demonstrate to the implementing agency that an alternate method can detect a release of the stored substance as effectively as any of the methods allowed in §§280.43(b) through (h) can detect a release of petroleum;

(ii) Provide information to the implementing agency on effective corrective action technologies, health risks, and chemical and physical properties of the stored substance, and the characteristics of the UST site; and,

(iii) Obtain approval from the implementing agency to use the alternate release detection method before the installation and operation of the new UST system.

§ 280.43 Methods of release detection for tanks.

Each method of release detection for tanks used to meet the requirements of §280.41 must be conducted in accordance with the following:

(a) *Inventory control.* Product inventory control (or another test of equivalent performance) must be conducted monthly to detect a release of at least 1.0 percent of flow-through plus 130 gallons on a monthly basis in the following manner:

(1) Inventory volume measurements for regulated substance inputs, withdrawals, and the amount still remaining in the tank are recorded each operating day;

(2) The equipment used is capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch;

(3) The regulated substance inputs are reconciled with delivery receipts by measurement of the tank inventory volume before and after delivery;

(4) Deliveries are made through a drop tube that extends to within one foot of the tank bottom;

(5) Product dispensing is metered and recorded within the local standards for meter calibration or an accuracy of 6 cubic inches for every 5 gallons of product withdrawn; and

(6) The measurement of any water level in the bottom of the tank is made to the nearest one-eighth of an inch at least once a month.

Note: Practices described in the American Petroleum Institute Publication 1621, “Recommended Practice for Bulk Liquid Stock Control at Retail Outlets,” may be used, where applicable, as guidance in meeting the requirements of this paragraph.

(b) *Manual tank gauging.* Manual tank gauging must meet the following requirements:

(1) Tank liquid level measurements are taken at the beginning and ending of a period of at least 36 hours during which no liquid is added to or removed from the tank;

(2) Level measurements are based on an average of two consecutive stick readings at both the beginning and ending of the period;

(3) The equipment used is capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch;

(4) A leak is suspected and subject to the requirements of subpart E if the variation between beginning and ending measurements exceeds the weekly or monthly standards in the following table:

Nominal tank capacity	Weekly standard (one test)	Monthly standard (average of four tests)
550 gallons or less	10 gallons	5 gallons.
551–1,000 gallons	13 gallons	7 gallons.
1,001–2,000 gallons	26 gallons	13 gallons.

(5) Only tanks of 550 gallons or less nominal capacity may use this as the sole method of release detection. Tanks of 551 to 2,000 gallons may use the method in place of manual inventory control in §280.43(a). Tanks of greater than 2,000 gallons nominal capacity may not use this method to meet the requirements of this subpart.

(c) *Tank tightness testing.* Tank tightness testing (or another test of equivalent performance) must be capable of detecting a 0.1 gallon per hour leak rate from any portion of the tank that routinely contains product while accounting for the effects of thermal expansion or contraction of the product, vapor pockets, tank deformation, evaporation or condensation, and the location of the water table.

(d) *Automatic tank gauging.* Equipment for automatic tank gauging that tests for the loss of product and conducts inventory control must meet the following requirements:

(1) The automatic product level monitor test can detect a 0.2 gallon per hour leak rate from any portion of the tank that routinely contains product; and

(2) Inventory control (or another test of equivalent performance) is conducted in accordance with the requirements of §280.43(a).

(e) *Vapor monitoring.* Testing or monitoring for vapors within the soil gas of the excavation zone must meet the following requirements:

(1) The materials used as backfill are sufficiently porous (e.g., gravel, sand, crushed rock) to readily allow diffusion of vapors from releases into the excavation area;

(2) The stored regulated substance, or a tracer compound placed in the tank system, is sufficiently volatile (e.g., gasoline) to result in a vapor level that is detectable by the monitoring devices located in the excavation zone in the event of a release from the tank;

(3) The measurement of vapors by the monitoring device is not rendered inoperative by the ground water, rainfall, or soil moisture or other known interferences so that a release could go undetected for more than 30 days;

(4) The level of background contamination in the excavation zone will not interfere with the method used to detect releases from the tank;

(5) The vapor monitors are designed and operated to detect any significant increase in concentration above background of the regulated substance stored in the tank system, a component or components of that substance, or a tracer compound placed in the tank system;

(6) In the UST excavation zone, the site is assessed to ensure compliance with the requirements in paragraphs (e) (1) through (4) of this section and to establish the number and positioning of monitoring wells that will detect releases within the excavation zone from any portion of the tank that routinely contains product; and

(7) Monitoring wells are clearly marked and secured to avoid unauthorized access and tampering.

(f) *Ground-water monitoring.* Testing or monitoring for liquids on the ground water must meet the following requirements:

(1) The regulated substance stored is immiscible in water and has a specific gravity of less than one;

(2) Ground water is never more than 20 feet from the ground surface and the hydraulic conductivity of the soil(s) between the UST system and the monitoring

wells or devices is not less than 0.01 cm/sec (e.g., the soil should consist of gravels, coarse to medium sands, coarse silts or other permeable materials);

(3) The slotted portion of the monitoring well casing must be designed to prevent migration of natural soils or filter pack into the well and to allow entry of regulated substance on the water table into the well under both high and low ground-water conditions;

(4) Monitoring wells shall be sealed from the ground surface to the top of the filter pack;

(5) Monitoring wells or devices intercept the excavation zone or are as close to it as is technically feasible;

(6) The continuous monitoring devices or manual methods used can detect the presence of at least one-eighth of an inch of free product on top of the ground water in the monitoring wells;

(7) Within and immediately below the UST system excavation zone, the site is assessed to ensure compliance with the requirements in paragraphs (f) (1) through (5) of this section and to establish the number and positioning of monitoring wells or devices that will detect releases from any portion of the tank that routinely contains product; and

(8) Monitoring wells are clearly marked and secured to avoid unauthorized access and tampering.

(g) *Interstitial monitoring.* Interstitial monitoring between the UST system and a secondary barrier immediately around or beneath it may be used, but only if the system is designed, constructed and installed to detect a leak from any portion of the tank that routinely contains product and also meets one of the following requirements:

(1) For double-walled UST systems, the sampling or testing method can detect a release through the inner wall in any portion of the tank that routinely contains product;

Note: The provisions outlined in the Steel Tank Institute's “Standard for Dual Wall Underground Storage Tanks” may be used as guidance for aspects of the design and construction of underground steel double-walled tanks.

(2) For UST systems with a secondary barrier within the excavation zone, the sampling or testing method used can detect a release between the UST system and the secondary barrier;

(i) The secondary barrier around or beneath the UST system consists of artificially constructed material that is sufficiently thick and impermeable (at least

10^{-6}cm/sec for the regulated substance stored) to direct a release to the monitoring point and permit its detection;

(ii) The barrier is compatible with the regulated substance stored so that a release from the UST system will not cause a deterioration of the barrier allowing a release to pass through undetected;

(iii) For cathodically protected tanks, the secondary barrier must be installed so that it does not interfere with the proper operation of the cathodic protection system;

(iv) The ground water, soil moisture, or rainfall will not render the testing or sampling method used inoperative so that a release could go undetected for more than 30 days;

(v) The site is assessed to ensure that the secondary barrier is always above the ground water and not in a 25-year flood plain, unless the barrier and monitoring designs are for use under such conditions; and,

(vi) Monitoring wells are clearly marked and secured to avoid unauthorized access and tampering.

(3) For tanks with an internally fitted liner, an automated device can detect a release between the inner wall of the tank and the liner, and the liner is compatible with the substance stored.

(h) *Other methods.* Any other type of release detection method, or combination of methods, can be used if:

(1) It can detect a 0.2 gallon per hour leak rate or a release of 150 gallons within a month with a probability of detection of 0.95 and a probability of false alarm of 0.05; or

(2) The implementing agency may approve another method if the owner and operator can demonstrate that the method can detect a release as effectively as any of the methods allowed in paragraphs (c) through (h) of this section. In comparing methods, the implementing agency shall consider the size of release that the method can detect and the frequency and reliability with which it can be detected. If the method is approved, the owner and operator must comply with any conditions imposed by the implementing agency on its use to ensure the protection of human health and the environment.

§ 280.44 Methods of release detection for piping.

Each method of release detection for piping used to meet the requirements of §280.41 must be conducted in accordance with the following:

(a) *Automatic line leak detectors.* Methods which alert the operator to the presence of a leak by restricting or shutting off the flow of regulated substances through piping or triggering an audible or visual alarm may be used only if they detect leaks of 3 gallons per hour at 10 pounds per square inch line pressure within 1 hour. An annual test of the operation of the leak detector must be conducted in accordance with the manufacturer's requirements.

(b) *Line tightness testing.* A periodic test of piping may be conducted only if it can detect a 0.1 gallon per hour leak rate at one and one-half times the operating pressure.

(c) *Applicable tank methods.* Any of the methods in §280.43 (e) through (h) may be used if they are designed to detect a release from any portion of the underground piping that routinely contains regulated substances.

§ 280.45 Release detection recordkeeping.

All UST system owners and operators must maintain records in accordance with §280.34 demonstrating compliance with all applicable requirements of this subpart. These records must include the following:

(a) All written performance claims pertaining to any release detection system used, and the manner in which these claims have been justified or tested by the equipment manufacturer or installer, must be maintained for 5 years, or for another reasonable period of time determined by the implementing agency, from the date of installation;

(b) The results of any sampling, testing, or monitoring must be maintained for at least 1 year, or for another reasonable period of time determined by the implementing agency, except that the results of tank tightness testing conducted in accordance with §280.43(c) must be retained until the next test is conducted; and

(c) Written documentation of all calibration, maintenance, and repair of release detection equipment permanently located on-site must be maintained for at least one year after the servicing work is completed, or for another reasonable time period determined by the implementing agency. Any schedules of required calibration and maintenance provided by the release detection equipment manufacturer must be retained for 5 years from the date of installation.

Subpart E—Release Reporting, Investigation, and Confirmation

§ 280.50 Reporting of suspected releases.

Owners and operators of UST systems must report to the implementing agency within 24 hours, or another reasonable time period specified by the implementing agency, and follow the procedures in §280.52 for any of the following conditions:

(a) The discovery by owners and operators or others of released regulated substances at the UST site or in the surrounding area (such as the presence of free product or vapors in soils, basements, sewer and utility lines, and nearby surface water).

(b) Unusual operating conditions observed by owners and operators (such as the erratic behavior of product dispensing equipment, the sudden loss of product from the UST system, or an unexplained presence of water in the tank), unless system equipment is found to be defective but not leaking, and is immediately repaired or replaced; and,

(c) Monitoring results from a release detection method required under §280.41 and §280.42 that indicate a release may have occurred unless:

(1) The monitoring device is found to be defective, and is immediately repaired, recalibrated or replaced, and additional monitoring does not confirm the initial result; or

(2) In the case of inventory control, a second month of data does not confirm the initial result.

§ 280.51 Investigation due to off-site impacts.

When required by the implementing agency, owners and operators of UST systems must follow the procedures in §280.52 to determine if the UST system is the source of off-site impacts. These impacts include the discovery of regulated substances (such as the presence of free product or vapors in soils, basements, sewer and utility lines, and nearby surface and drinking waters) that has been observed by the implementing agency or brought to its attention by another party.

§ 280.52 Release investigation and confirmation steps.

Unless corrective action is initiated in accordance with subpart F, owners and operators must immediately investigate and confirm all suspected releases of regulated substances requiring reporting under §280.50 within 7 days, or another reasonable time period specified by the implementing agency, using either the following steps or another procedure approved by the implementing agency:

(a) *System test.* Owners and operators must conduct tests (according to the requirements for tightness testing in §280.43(c) and §280.44(b)) that determine whether a leak exists in that portion of the tank that routinely contains product, or the attached delivery piping, or both.

(1) Owners and operators must repair, replace or upgrade the UST system, and begin corrective action in accordance with subpart F if the test results for the system, tank, or delivery piping indicate that a leak exists.

(2) Further investigation is not required if the test results for the system, tank, and delivery piping do not indicate that a leak exists and if environmental contamination is not the basis for suspecting a release.

(3) Owners and operators must conduct a site check as described in paragraph (b) of this section if the test results for the system, tank, and delivery piping do not indicate that a leak exists but environmental contamination is the basis for suspecting a release.

(b) *Site check.* Owners and operators must measure for the presence of a release where contamination is most likely to be present at the UST site. In selecting sample types, sample locations, and measurement methods, owners and operators must consider the nature of the stored substance, the type of initial alarm or cause for suspicion, the type of backfill, the depth of ground water, and other factors appropriate for identifying the presence and source of the release.

(1) If the test results for the excavation zone or the UST site indicate that a release has occurred, owners and operators must begin corrective action in accordance with subpart F;

(2) If the test results for the excavation zone or the UST site do not indicate that a release has occurred, further investigation is not required.

§ 280.53 Reporting and cleanup of spills and overfills.

(a) Owners and operators of UST systems must contain and immediately clean up a spill or overfill and report to the implementing agency within 24 hours, or another reasonable time period specified by the implementing agency, and begin corrective action in accordance with subpart F in the following cases:

(1) Spill or overfill of petroleum that results in a release to the environment that exceeds 25 gallons or another reasonable amount specified by the implementing agency, or that causes a sheen on nearby surface water; and

(2) Spill or overfill of a hazardous substance that results in a release to the environment that equals or exceeds its reportable quantity under CERCLA (40 CFR part 302).

(b) Owners and operators of UST systems must contain and immediately clean up a spill or overfill of petroleum that is less than 25 gallons or another reasonable amount specified by the implementing agency, and a spill or overfill of a hazardous substance that is less than the reportable quantity. If cleanup cannot be accomplished within 24 hours, or another reasonable time period established by the implementing agency, owners and operators must immediately notify the implementing agency.

Note: Pursuant to §§302.6 and 355.40, a release of a hazardous substance equal to or in excess of its reportable quantity must also be reported immediately (rather than within 24 hours) to the National Response Center under sections 102 and 103 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and to appropriate state and local authorities under Title III of the Superfund Amendments and Reauthorization Act of 1986.

Subpart F—Release Response and Corrective Action for UST Systems Containing Petroleum or Hazardous Substances

§ 280.60 General.

Owners and operators of petroleum or hazardous substance UST systems must, in response to a confirmed release from the UST system, comply with the requirements of this subpart except for USTs excluded under §280.10(b) and UST systems subject to RCRA Subtitle C corrective action requirements under section 3004(u) of the Resource Conservation and Recovery Act, as amended.

§ 280.61 Initial response.

Upon confirmation of a release in accordance with §280.52 or after a release from the UST system is identified in any other manner, owners and operators must perform the following initial response actions within 24 hours of a release or within another reasonable period of time determined by the implementing agency:

(a) Report the release to the implementing agency (e.g., by telephone or electronic mail);

(b) Take immediate action to prevent any further release of the regulated substance into the environment; and

(c) Identify and mitigate fire, explosion, and vapor hazards.

§ 280.62 Initial abatement measures and site check.

(a) Unless directed to do otherwise by the implementing agency, owners and operators must perform the following abatement measures:

(1) Remove as much of the regulated substance from the UST system as is necessary to prevent further release to the environment;

(2) Visually inspect any aboveground releases or exposed belowground releases and prevent further migration of the released substance into surrounding soils and ground water;

(3) Continue to monitor and mitigate any additional fire and safety hazards posed by vapors or free product that have migrated from the UST excavation zone and entered into subsurface structures (such as sewers or basements);

(4) Remedy hazards posed by contaminated soils that are excavated or exposed as a result of release confirmation, site investigation, abatement, or corrective action activities. If these remedies include treatment or disposal of soils, the owner and operator must comply with applicable State and local requirements;

(5) Measure for the presence of a release where contamination is most likely to be present at the UST site, unless the presence and source of the release have been confirmed in accordance with the site check required by §280.52(b) or the closure site assessment of §280.72(a). In selecting sample types, sample locations, and measurement methods, the owner and operator must consider the nature of the stored substance, the type of backfill, depth to ground water and other factors as appropriate for identifying the presence and source of the release; and

(6) Investigate to determine the possible presence of free product, and begin free product removal as soon as practicable and in accordance with §280.64.

(b) Within 20 days after release confirmation, or within another reasonable period of time determined by the implementing agency, owners and operators must submit a report to the implementing agency summarizing the initial abatement steps taken under paragraph (a) of this section and any resulting information or data.

§ 280.63 Initial site characterization.

(a) Unless directed to do otherwise by the implementing agency, owners and operators must assemble information about the site and the nature of the release, including information gained while confirming the release or completing the initial abatement measures in §§280.60 and 280.61. This information must include, but is not necessarily limited to the following:

(1) Data on the nature and estimated quantity of release;

(2) Data from available sources and/or site investigations concerning the following factors: surrounding populations, water quality, use and approximate locations of wells potentially affected by the release, subsurface soil conditions, locations of subsurface sewers, climatological conditions, and land use;

(3) Results of the site check required under §280.62(a)(5); and

(4) Results of the free product investigations required under §280.62(a)(6), to be used by owners and operators to determine whether free product must be recovered under §280.64.

(b) Within 45 days of release confirmation or another reasonable period of time determined by the implementing agency, owners and operators must submit the information collected in compliance with paragraph (a) of this section to the implementing agency in a manner that demonstrates its applicability and technical adequacy, or in a format and according to the schedule required by the implementing agency.

§ 280.64 Free product removal.

At sites where investigations under §280.62(a)(6) indicate the presence of free product, owners and operators must remove free product to the maximum extent practicable as determined by the implementing agency while continuing, as necessary, any actions initiated under §§280.61 through 280.63, or preparing for actions required under §§280.65 through 280.66. In meeting the requirements of this section, owners and operators must:

(a) Conduct free product removal in a manner that minimizes the spread of contamination into previously uncontaminated zones by using recovery and disposal techniques appropriate to the hydrogeologic conditions at the site, and that properly treats, discharges or disposes of recovery byproducts in compliance with applicable local, State and Federal regulations;

(b) Use abatement of free product migration as a minimum objective for the design of the free product removal system;

(c) Handle any flammable products in a safe and competent manner to prevent fires or explosions; and

(d) Unless directed to do otherwise by the implementing agency, prepare and submit to the implementing agency, within 45 days after confirming a release, a free product removal report that provides at least the following information:

(1) The name of the person(s) responsible for implementing the free product removal measures;

(2) The estimated quantity, type, and thickness of free product observed or measured in wells, boreholes, and excavations;

(3) The type of free product recovery system used;

(4) Whether any discharge will take place on-site or off-site during the recovery operation and where this discharge will be located;

(5) The type of treatment applied to, and the effluent quality expected from, any discharge;

(6) The steps that have been or are being taken to obtain necessary permits for any discharge; and

(7) The disposition of the recovered free product.

§ 280.65 Investigations for soil and ground-water cleanup.

(a) In order to determine the full extent and location of soils contaminated by the release and the presence and concentrations of dissolved product contamination in the ground water, owners and operators must conduct investigations of the release, the release site, and the surrounding area possibly affected by the release if any of the following conditions exist:

(1) There is evidence that ground-water wells have been affected by the release (e.g., as found during release confirmation or previous corrective action measures);

(2) Free product is found to need recovery in compliance with §280.64;

(3) There is evidence that contaminated soils may be in contact with ground water (e.g., as found during conduct of the initial response measures or investigations required under §§280.60 through 280.64); and

(4) The implementing agency requests an investigation, based on the potential effects of contaminated soil or ground water on nearby surface water and ground-water resources.

(b) Owners and operators must submit the information collected under paragraph (a) of this section as soon as practicable or in accordance with a schedule established by the implementing agency.

§ 280.66 Corrective action plan.

(a) At any point after reviewing the information submitted in compliance with §§280.61 through 280.63, the implementing agency may require owners and operators to submit additional information or to develop and submit a corrective action plan for responding to contaminated soils and ground water. If a plan is required, owners and operators must submit the plan according to a schedule and format established by the implementing agency. Alternatively, owners and operators may, after fulfilling the requirements of §§280.61 through 280.63, choose to submit a corrective action plan for responding to contaminated soil and ground water. In either case, owners and operators are responsible for submitting a plan that provides for adequate protection of human health and the environment as determined by the implementing agency, and must modify their plan as necessary to meet this standard.

(b) The implementing agency will approve the corrective action plan only after ensuring that implementation of the plan will adequately protect human health, safety, and the environment. In making this determination, the implementing agency should consider the following factors as appropriate:

(1) The physical and chemical characteristics of the regulated substance, including its toxicity, persistence, and potential for migration;

(2) The hydrogeologic characteristics of the facility and the surrounding area;

(3) The proximity, quality, and current and future uses of nearby surface water and ground water;

(4) The potential effects of residual contamination on nearby surface water and ground water;

(5) An exposure assessment; and

(6) Any information assembled in compliance with this subpart.

(c) Upon approval of the corrective action plan or as directed by the implementing agency, owners and operators must implement the plan, including modifications to the plan made by the implementing agency. They must monitor, evaluate, and report the results of implementing the plan in accordance with a schedule and in a format established by the implementing agency.

(d) Owners and operators may, in the interest of minimizing environmental contamination and promoting more effective cleanup, begin cleanup of soil and ground water before the corrective action plan is approved provided that they:

(1) Notify the implementing agency of their intention to begin cleanup;

(2) Comply with any conditions imposed by the implementing agency, including halting cleanup or mitigating adverse consequences from cleanup activities; and

(3) Incorporate these self-initiated cleanup measures in the corrective action plan that is submitted to the implementing agency for approval.

§ 280.67 Public participation.

(a) For each confirmed release that requires a corrective action plan, the implementing agency must provide notice to the public by means designed to reach those members of the public directly affected by the release and the planned corrective action. This notice may include, but is not limited to, public notice in local newspapers, block advertisements, public service announcements, publication in a state register, letters to individual households, or personal contacts by field staff.

(b) The implementing agency must ensure that site release information and decisions concerning the corrective action plan are made available to the public for inspection upon request.

(c) Before approving a corrective action plan, the implementing agency may hold a public meeting to consider comments on the proposed corrective action plan if there is sufficient public interest, or for any other reason.

(d) The implementing agency must give public notice that complies with paragraph (a) of this section if implementation of an approved corrective action plan does not achieve the established cleanup levels in the plan and termination of that plan is under consideration by the implementing agency.

Subpart G—Out-of-Service UST Systems and Closure

§ 280.70 Temporary closure.

(a) When an UST system is temporarily closed, owners and operators must continue operation and maintenance of corrosion protection in accordance with §280.31, and any release detection in accordance with subpart D. Subparts E and F must be complied with if a release is suspected or confirmed. However, release detection is not required as long as the UST system is empty. The UST system is empty when all materials have been removed using commonly employed practices so that no more than 2.5 centimeters (one inch) of residue, or 0.3 percent by weight of the total capacity of the UST system, remain in the system.

(b) When an UST system is temporarily closed for 3 months or more, owners and operators must also comply with the following requirements:

(1) Leave vent lines open and functioning; and

(2) Cap and secure all other lines, pumps, manways, and ancillary equipment.

(c) When an UST system is temporarily closed for more than 12 months, owners and operators must permanently close the UST system if it does not meet either performance standards in §280.20 for new UST systems or the upgrading requirements in §280.21, *except that* the spill and overfill equipment requirements do not have to be met. Owners and operators must permanently close the substandard UST systems at the end of this 12-month period in accordance with §§280.71–280.74, *unless* the implementing agency provides an extension of the 12-month temporary closure period. Owners and operators must complete a site assessment in accordance with §280.72 before such an extension can be applied for.

§ 280.71 Permanent closure and changes-in-service.

(a) At least 30 days before beginning either permanent closure or a change-in-service under paragraphs (b) and (c) of this section, or within another reasonable time period determined by the implementing agency, owners and operators must notify the implementing agency of their intent to permanently close or make the change-in-service, *unless* such action is in response to corrective action. The required assessment of the excavation zone under §280.72 must be performed after notifying the implementing agency but before completion of the permanent closure or a change-in-service.

(b) To permanently close a tank, owners and operators must empty and clean it by removing all liquids and accumulated sludges. All tanks taken out of service permanently must also be either removed from the ground or filled with an inert solid material.

(c) Continued use of an UST system to store a non-regulated substance is considered a change-in-service. Before a change-in-service, owners and operators must empty and clean the tank by removing all liquid and accumulated sludge and conduct a site assessment in accordance with §280.72.

Note: The following cleaning and closure procedures may be used to comply with this section:

(A) American Petroleum Institute Recommended Practice 1604, “Removal and Disposal of Used Underground Petroleum Storage Tanks”;

(B) American Petroleum Institute Publication 2015, “Cleaning Petroleum Storage Tanks”;

(C) American Petroleum Institute Recommended Practice 1631, “Interior Lining of Underground Storage Tanks,” may be used as guidance for compliance with this section; and

(D) The National Institute for Occupational Safety and Health “Criteria for a Recommended Standard * * * Working in Confined Space” may be used as guidance for conducting safe closure procedures at some hazardous substance tanks.

§ 280.72 Assessing the site at closure or change-in-service.

(a) Before permanent closure or a change-in-service is completed, owners and operators must measure for the presence of a release where contamination is most likely to be present at the UST site. In selecting sample types, sample locations, and measurement methods, owners and operators must consider the method of closure, the nature of the stored substance, the type of backfill, the depth to ground water, and other factors appropriate for identifying the presence of a release. The requirements of this section are satisfied if one of the external release detection methods allowed in §280.43 (e) and (f) is operating in accordance with the requirements in §280.43 at the time of closure, and indicates no release has occurred.

(b) If contaminated soils, contaminated ground water, or free product as a liquid or vapor is discovered under paragraph (a) of this section, or by any other manner, owners and operators must begin corrective action in accordance with subpart F.

§ 280.73 Applicability to previously closed UST systems.

When directed by the implementing agency, the owner and operator of an UST system permanently closed before December 22, 1988 must assess the excavation zone and close the UST system in accordance with this subpart if releases from the UST may, in the judgment of the implementing agency, pose a current or potential threat to human health and the environment.

§ 280.74 Closure records.

Owners and operators must maintain records in accordance with §280.34 that are capable of demonstrating compliance with closure requirements under this subpart. The results of the excavation zone assessment required in §280.72 must be maintained for at least 3 years after completion of permanent closure or change-in-service in one of the following ways:

(a) By the owners and operators who took the UST system out of service;

(b) By the current owners and operators of the UST system site; or

(c) By mailing these records to the implementing agency if they cannot be maintained at the closed facility.

Subpart H—Financial Responsibility

Source: 53 FR 43370, Oct. 26, 1988, unless otherwise noted.

§ 280.90 Applicability.

(a) This subpart applies to owners and operators of all petroleum underground storage tank (UST) systems except as otherwise provided in this section.

(b) Owners and operators of petroleum UST systems are subject to these requirements if they are in operation on or after the date for compliance established in §280.91.

(c) State and Federal government entities whose debts and liabilities are the debts and liabilities of a state or the United States are exempt from the requirements of this subpart.

(d) The requirements of this subpart do not apply to owners and operators of any UST system described in §280.10 (b) or (c).

(e) If the owner and operator of a petroleum underground storage tank are separate persons, only one person is required to demonstrate financial responsibility; however, both parties are liable in event of noncompliance. Regardless of which party complies, the date set for compliance at a particular facility is determined by the characteristics of the owner as set forth in §280.91.

§ 280.91 Compliance dates.

Owners of petroleum underground storage tanks are required to comply with the requirements of this subpart by the following dates:

(a) All petroleum marketing firms owning 1,000 or more USTs and all other UST owners that report a tangible net worth of $20 million or more to the U.S. Securities and Exchange Commission (SEC), Dun and Bradstreet, the Energy Information Administration, or the Rural Electrification Administration; January 24, 1989, except that compliance with §280.94(b) is required by: July 24, 1989.

(b) All petroleum marketing firms owning 100–999 USTs; October 26, 1989.

(c) All petroleum marketing firms owning 13–99 USTs at more than one facility; April 26, 1991.

(d) All petroleum UST owners not described in paragraphs (a), (b), or (c) of this section, excluding local government entities; December 31, 1993.

(e) All local government entities (including Indian tribes) not included in paragraph (f) of this section; February 18, 1994.

(f) Indian tribes that own USTs on Indian lands which meet the applicable technical requirements of this part; December 31, 1998.

[53 FR 43370, Oct. 26, 1988, as amended at 54 FR 5452, Feb. 3, 1989; 55 FR 18567, May 2, 1990; 55 FR 46025, Oct. 31, 1990; 56 FR 66373, Dec. 23, 1991; 59 FR 9607, Feb. 28, 1994]

§ 280.92 Definition of terms.

When used in this subpart, the following terms shall have the meanings given below:

Accidental release means any sudden or nonsudden release of petroleum from an underground storage tank that results in a need for corrective action and/or compensation for bodily injury or property damage neither expected nor intended by the tank owner or operator.

Bodily injury shall have the meaning given to this term by applicable state law; however, this term shall not include those liabilities which, consistent with standard insurance industry practices, are excluded from coverage in liability insurance policies for bodily injury.

Chief Financial Officer, in the case of local government owners and operators, means the individual with the overall authority and responsibility for the collection, disbursement, and use of funds by the local government.

Controlling interest means direct ownership of at least 50 percent of the voting stock of another entity.

Director of the Implementing Agency means the EPA Regional Administrator, or, in the case of a state with a program approved under section 9004, the Director of the designated state or local agency responsible for carrying out an approved UST program.

Financial reporting year means the latest consecutive twelve-month period for which any of the following reports used to support a financial test is prepared:

(1) a 10–K report submitted to the SEC;

(2) an annual report of tangible net worth submitted to Dun and Bradstreet; or

(3) annual reports submitted to the Energy Information Administration or the Rural Electrification Administration.

“Financial reporting year” may thus comprise a fiscal or a calendar year period.

Legal defense cost is any expense that an owner or operator or provider of financial assurance incurs in defending against claims or actions brought,

(1) By EPA or a state to require corrective action or to recover the costs of corrective action;

(2) By or on behalf of a third party for bodily injury or property damage caused by an accidental release; or

(3) By any person to enforce the terms of a financial assurance mechanism.

Local government shall have the meaning given this term by applicable state law and includes Indian tribes. The term is generally intended to include: (1) Counties, municipalities, townships, separately chartered and operated special districts (including local government public transit systems and redevelopment authorities), and independent school districts authorized as governmental bodies by state charter or constitution; and (2) Special districts and independent school districts established by counties, municipalities, townships, and other general purpose governments to provide essential services.

Occurrence means an accident, including continuous or repeated exposure to conditions, which results in a release from an underground storage tank.

Note: This definition is intended to assist in the understanding of these regulations and is not intended either to limit the meaning of “occurrence” in a way that conflicts with standard insurance usage or to prevent the use of other standard insurance terms in place of “occurrence.”

Owner or operator, when the owner or operator are separate parties, refers to the party that is obtaining or has obtained financial assurances.

Petroleum marketing facilities include all facilities at which petroleum is produced or refined and all facilities from which petroleum is sold or transferred to other petroleum marketers or to the public.

Petroleum marketing firms are all firms owning petroleum marketing facilities. Firms owning other types of facilities with USTs as well as petroleum marketing facilities are considered to be petroleum marketing firms.

Property damage shall have the meaning given this term by applicable state law. This term shall not include those liabilities which, consistent with standard insurance industry practices, are excluded from coverage in liability insurance policies for property damage. However, such exclusions for property damage shall not include corrective action associated with releases from tanks which are covered by the policy.

Provider of financial assurance means an entity that provides financial assurance to an owner or operator of an underground storage tank through one of the mechanisms listed in §§280.95–280.103, including a guarantor, insurer, risk retention group, surety, issuer of a letter of credit, issuer of a state-required mechanism, or a state.

Substantial business relationship means the extent of a business relationship necessary under applicable state law to make a guarantee contract issued incident to that relationship valid and enforceable. A guarantee contract is issued “incident to that relationship” if it arises from and depends on existing economic transactions between the guarantor and the owner or operator.

Substantial governmental relationship means the extent of a governmental relationship necessary under applicable state law to make an added guarantee contract issued incident to that relationship valid and enforceable. A guarantee contract is issued “incident to that relationship” if it arises from a clear commonality of interest in the event of an UST release such as coterminous boundaries, overlapping constituencies, common ground-water aquifer, or other relationship other than monetary compensation that provides a motivation for the guarantor to provide a guarantee.

Tangible net worth means the tangible assets that remain after deducting liabilities; such assets do not include intangibles such as goodwill and rights to patents or royalties. For purposes of this definition, “assets” means all existing and all probable future economic benefits obtained or controlled by a particular entity as a result of past transactions.

Termination under §280.97(b)(1) and §280.97(b)(2) means only those changes that could result in a gap in coverage as where the insured has not obtained substitute coverage or has obtained substitute coverage with a different retroactive date than the retroactive date of the original policy.

[53 FR 43370, Oct. 26, 1988, as amended at 54 FR 47081, Nov. 9, 1989; 58 FR 9050, Feb. 18, 1993]

§ 280.93 Amount and scope of required financial responsibility.

(a) Owners or operators of petroleum underground storage tanks must demonstrate financial responsibility for taking corrective action and for compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks in at least the following per-occurrence amounts:

(1) For owners or operators of petroleum underground storage tanks that are located at petroleum marketing facilities, or that handle an average of more than 10,000 gallons of petroleum per month based on annual throughput for the previous calendar year; $1 million.

(2) For all other owners or operators of petroleum underground storage tanks; $500,000.

(b) Owners or operators of petroleum underground storage tanks must demonstrate financial responsibility for taking corrective action and for compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks in at least the following annual aggregate amounts:

(1) For owners or operators of 1 to 100 petroleum underground storage tanks, $1 million; and

(2) For owners or operators of 101 or more petroleum underground storage tanks, $2 million.

(c) For the purposes of paragraphs (b) and (f) of this section, only, “a petroleum underground storage tank” means a single containment unit and does not mean combinations of single containment units.

(d) Except as provided in paragraph (e) of this section, if the owner or operator uses separate mechanisms or separate combinations of mechanisms to demonstrate financial responsibility for:

(1) Taking corrective action;

(2) Compensating third parties for bodily injury and property damage caused by sudden accidental releases; or

(3) Compensating third parties for bodily injury and property damage caused by nonsudden accidental releases, the amount of assurance provided by each mechanism or combination of mechanisms must be in the full amount specified in paragraphs (a) and (b) of this section.

(e) If an owner or operator uses separate mechanisms or separate combinations of mechanisms to demonstrate financial responsibility for different petroleum underground storage tanks, the annual aggregate required shall be based on the number of tanks covered by each such separate mechanism or combination of mechanisms.

(f) Owners or operators shall review the amount of aggregate assurance provided whenever additional petroleum underground storage tanks are acquired or installed. If the number of petroleum underground storage tanks for which assurance must be provided exceeds 100, the owner or operator shall demonstrate financial responsibility in the amount of at least $2 million of annual aggregate assurance by the anniversary of the date on which the mechanism demonstrating financial responsibility became effective. If assurance is being demonstrated by a combination of mechanisms, the owner or operator shall demonstrate financial responsibility in the amount of at least $2 million of annual aggregate assurance by the first-occurring effective date anniversary of any one of the mechanisms combined (other than a financial test or guarantee) to provide assurance.

(g) The amounts of assurance required under this section exclude legal defense costs.

(h) The required per-occurrence and annual aggregate coverage amounts do not in any way limit the liability of the owner or operator.

§ 280.94 Allowable mechanisms and combinations of mechanisms.

(a) Subject to the limitations of paragraphs (b) and (c) of this section,

(1) An owner or operator, including a local government owner or operator, may use any one or combination of the mechanisms listed in §§280.95 through 280.103 to demonstrate financial responsibility under this subpart for one or more underground storage tanks, and

(2) A local government owner or operator may use any one or combination of the mechanisms listed in §§280.104 through 280.107 to demonstrate financial responsibility under this subpart for one or more underground storage tanks.

(b) An owner or operator may use a guarantee under §280.96 or surety bond under §280.98 to establish financial responsibility only if the Attorney(s) General of the state(s) in which the underground storage tanks are located has (have) submitted a written statement to the implementing agency that a guarantee or surety bond executed as described in this section is a legally valid and enforceable obligation in that state.

(c) An owner or operator may use self-insurance in combination with a guarantee only if, for the purpose of meeting the requirements of the financial test under this rule, the financial statements of the owner or operator are not consolidated with the financial statements of the guarantor.

[53 FR 43370, Oct. 26, 1988, as amended at 58 FR 9051, Feb. 18, 1993]

§ 280.95 Financial test of self-insurance.

(a) An owner or operator, and/or guarantor, may satisfy the requirements of §280.93 by passing a financial test as specified in this section. To pass the financial test of self-insurance, the owner or operator, and/or guarantor must meet the criteria of paragraph (b) or (c) of this section based on year-end financial statements for the latest completed fiscal year.

(b)(1) The owner or operator, and/or guarantor, must have a tangible net worth of at least ten times:

(i) The total of the applicable aggregate amount required by §280.93, based on the number of underground storage tanks for which a financial test is used to demonstrate financial responsibility to EPA under this section or to a state implementing agency under a state program approved by EPA under 40 CFR part 281;

(ii) The sum of the corrective action cost estimates, the current closure and post-closure care cost estimates, and amount of liability coverage for which a financial test is used to demonstrate financial responsibility to EPA under 40 CFR 264.101, 264.143, 264.145, 265.143, 165.145, 264.147, and 265.147 or to a state implementing agency under a state program authorized by EPA under 40 CFR part 271; and

(iii) The sum of current plugging and abandonment cost estimates for which a financial test is used to demonstrate financial responsibility to EPA under 40 CFR 144.63 or to a state implementing agency under a state program authorized by EPA under 40 CFR part 145.

(2) The owner or operator, and/or guarantor, must have a tangible net worth of at least $10 million.

(3) The owner or operator, and/or guarantor, must have a letter signed by the chief financial officer worded as specified in paragraph (d) of this section.

(4) The owner or operator, and/or guarantor, must either:

(i) File financial statements annually with the U.S. Securities and Exchange Commission, the Energy Information Administration, or the Rural Electrification Administration; or

(ii) Report annually the firm's tangible net worth to Dun and Bradstreet, and Dun and Bradstreet must have assigned the firm a financial strength rating of 4A or 5A.

(5) The firm's year-end financial statements, if independently audited, cannot include an adverse auditor's opinion, a disclaimer of opinion, or a “going concern” qualification.

(c)(1) The owner or operator, and/or guarantor must meet the financial test requirements of 40 CFR 264.147(f)(1), substituting the appropriate amounts specified in §280.93 (b)(1) and (b)(2) for the “amount of liability coverage” each time specified in that section.

(2) The fiscal year-end financial statements of the owner or operator, and/or guarantor, must be examined by an independent certified public accountant and be accompanied by the accountant's report of the examination.

(3) The firm's year-end financial statements cannot include an adverse auditor's opinion, a disclaimer of opinion, or a “going concern” qualification.

(4) The owner or operator, and/or guarantor, must have a letter signed by the chief financial officer, worded as specified in paragraph (d) of this section.

(5) If the financial statements of the owner or operator, and/or guarantor, are not submitted annually to the U.S. Securities and Exchange Commission, the Energy Information Administration or the Rural Electrification Administration, the owner or operator, and/or guarantor, must obtain a special report by an independent certified public accountant stating that:

(i) He has compared the data that the letter form the chief financial officer specifies as having been derived from the latest year-end financial statements of the owner or operator, and/or guarantor, with the amounts in such financial statements; and

(ii) In connection with that comparison, no matters came to his attention which caused him to believe that the specified data should be adjusted.

(d) To demonstrate that it meets the financial test under paragraph (b) or (c) of this section, the chief financial officer of the owner or operator, or guarantor, must sign, within 120 days of the close of each financial reporting year, as defined by the twelve-month period for which financial statements used to support the financial test are prepared, a letter worded exactly as follows, except that the instructions in brackets are to be replaced by the relevant information and the brackets deleted:

Letter from Chief Financial Officer

I am the chief financial officer of [insert: name and address of the owner or operator, or guarantor]. This letter is in support of the use of [insert: “the financial test of self-insurance,” and/or “guarantee”] to demonstrate financial responsibility for [insert: “taking corrective action” and/or “compensating third parties for bodily injury and property damage”] caused by [insert:

“suddent accidential releases” and/or “nonsudden accidential releases”] in the amount of at least [insert: dollar amount] per occurrence and [insert: dollar amount] annual aggregate arising from operating (an) underground storage tank(s).

Underground storage tanks at the following facilities are assured by this financial test or a financial test under an authorized State program by this [insert: “owner or operator,” and/or “guarantor”]: [List for each facility: the name and address of the facility where tanks assured by this financial test are located, and whether tanks are assured by this financial test or a financial test under a State program approved under 40 CFR part 281. If separate mechanisms or combinations of mechanisms are being used to assure any of the tanks at this facility, list each tank assured by this financial test or a financial test under a State program authorized under 40 CFR part 281 by the tank identification number provided in the notification submitted pursuant to 40 CFR 280.22 or the corresponding State requirements.]

A [insert: “financial test,” and/or “guarantee”] is also used by this [insert: “owner or operator,” or “guarantor”] to demonstrate evidence of financial responsibility in the following amounts under other EPA regulations or state programs authorized by EPA under 40 CFR parts 271 and 145:

EPA Regulations	***Amount***
Closure (§§264.143 and 265.143)	$____
Post-Closure Care (§§264.145 and 265.145)	$____
Liability Coverage (§§264.147 and 265.147)	$____
Corrective Action (§§264.101(b))	$____
Plugging and Abandonment (§144.63)	$____
Closure	$____
Post-Closure Care	$____
Liabilitly Coverage	$____
Corrective Action	$____
Plugging and Abandonment	$____
Total	$____

This [insert: “owner or operator,” or “guarantor”] has not received an adverse opinion, a disclaimer of opinion, or a “going concern” qualification from an independent auditor on his financial statements for the latest completed fiscal year.

[Fill in the information for Alternative I if the criteria of paragraph (b) of §280.95 are being used to demonstrate compliance with the financial test requirements. Fill in the information for Alternative II if the criteria of paragraph (c) of §280.95 are being used to demonstrate compliance with the financial test requirements.]

Alternative I

1.	Amount of annual UST aggregate coverage being assured by a financial test, and/or guarantee	$____
2.	Amount of corrective action, closure and post-closure care costs, liability coverage, and plugging and abandonment costs covered by a financial test, and/or guarantee	$____
3.	Sum of lines 1 and 2	$____
4.	Total tangible assets	$____
5.	Total liabilities [if any of the amount reported on line 3 is included in total liabilities, you may deduct that amount from this line and add that amount to line 6]	$____
6.	Tangible net worth [subtract line 5 from line 4]	$____
		Yes No
7.	Is line 6 at least $10 million?	__ _
8.	Is line 6 at least 10 times line 3?	__ _
9.	Have financial statements for the latest fiscal year been filed with the Securities and Exchange Commission?	__ _
10.	Have financial statements for the latest fiscal year been filed with the Energy Information Administration?	__ _
11.	Have financial statements for the lastest fiscal year been filed with the Rural Electrification Administration?	__ _
12.	Has financial information been provided to Dun and Bradstreet, and has Dun and Bradstreet provided a financial strength rating of 4A or 5A? [Answer "Yes" only if both criteria have been met.]	__ _

Alternative II

1.	Amount of annual UST aggregate coverage being assured by a test, and/or guarantee	$____
2.	Amount of corrective action, closure and post-closure care costs, liability coverage, and plugging and abandonment costs covered by a financial test, and/or guarantee	$____
3.	Sum of lines 1 and 2	$____
4.	Total tangible assets	$____
5.	Total liabilities [if any of the amount reported on line 3 is included in total liabilities, you may deduct that amount from this line and add that amount to line 6]	$____
6.	Tangible net worth [subtract line 5 from line 4]	$____
7.	Total assets in the U.S. [required only if less than 90 percent of assets are located in the U.S.]	$____
		Yes No
8.	Is line 6 at least $10 million?	$__ _
9.	Is line 6 at least 6 times line 3?	__ _
10.	Are at least 90 percent of assets located in the U.S.? [If “No,” complete line 11.]	__ _
11.	Is line 7 at least 6 times line 3?	__ _
[Fill in either lines 12–15 or lines 16–18:]		
12.	Current assets	$____
13.	Current liabilities	____
14.	Net working capital [subtract line 13 from line 12]	_____
		Yes No
15.	Is line 14 at least 6 times line 3?	__ _
16.	Current bond rating of most recent bond issue	__ _
17.	Name of rating service	__ _
18.	Date of maturity of bond	__ _
19.	Have financial statements for the latest fiscal year been filed with the SEC, the Energy Information Administration, or the Rural Electrification Administration?	__ _

[If "No," please attach a report from an independent certified public accountant certifying that there are no material differences between the data as reported in lines 4–18 above and the financial statements for the latest fiscal year.]

[For both Alternative I and Alternative II complete the certification with this statement.]

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR part 280.95(d) as such regulations were constituted on the date shown immediately below.

[Signature]

[Name]

[Title]

[Date]

(e) If an owner or operator using the test to provide financial assurance finds that he or she no longer meets the requirements of the financial test based on the year-end financial statements, the owner or operator must obtain alternative coverage within 150 days of the end of the year for which financial statements have been prepared.

(f) The Director of the implementing agency may require reports of financial condition at any time from the owner or operator, and/or guarantor. If the Director finds, on the basis of such reports or other information, that the owner or operator, and/or guarantor, no longer meets the financial test requirements of §280.95(b) or (c) and (d), the owner or operator must obtain alternate coverage within 30 days after notification of such a finding.

(g) If the owner or operator fails to obtain alternate assurance within 150 days of finding that he or she no longer meets the requirements of the financial test based on the year-end financial statements, or within 30 days of notification by the Director of the implementing agency that he or she no longer meets the requirements of the financial test, the owner or operator must notify the Director of such failure within 10 days.

§ 280.96 Guarantee.

(a) An owner or operator may satisfy the requirements of §280.93 by obtaining a guarantee that conforms to the requirements of this section. The guarantor must be:

(1) A firm that (i) possesses a controlling interest in the owner or operator; (ii) possesses a controlling interest in a firm described under paragraph (a)(1)(i) of

this section; or, (iii) is controlled through stock ownership by a common parent firm that possesses a controlling interest in the owner or operator; or,

(2) A firm engaged in a substantial business relationship with the owner or operator and issuing the guarantee as an act incident to that business relationship.

(b) Within 120 days of the close of each financial reporting year the guarantor must demonstrate that it meets the financial test criteria of §280.95 based on year-end financial statements for the latest completed financial reporting year by completing the letter from the chief financial officer described in §280.95(d) and must deliver the letter to the owner or operator. If the guarantor fails to meet the requirements of the financial test at the end of any financial reporting year, within 120 days of the end of that financial reporting year the guarantor shall send by certified mail, before cancellation or nonrenewal of the guarantee, notice to the owner or operator. If the Director of the implementing agency notifies the guarantor that he no longer meets the requirements of the financial test of §280.95 (b) or (c) and (d), the guarantor must notify the owner or operator within 10 days of receiving such notification from the Director. In both cases, the guarantee will terminate no less than 120 days after the date the owner or operator receives the notification, as evidenced by the return receipt. The owner or operator must obtain alternative coverage as specified in §280.110(c).

(c) The guarantee must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

Guarantee

Guarantee made this [date] by [name of guaranteeing entity], a business entity organized under the laws of the state of [name of state], herein referred to as guarantor, to [the state implementing agency] and to any and all third parties, and obligees, on behalf of [owner or operator] of [business address].

Recitals.

(1) Guarantor meets or exceeds the financial test criteria of 40 CFR 280.95 (b) or (c) and (d) and agrees to comply with the requirements for guarantors as specified in 40 CFR 280.96(b).

(2) [Owner or operator] owns or operates the following underground storage tank(s) covered by this guarantee: [List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR 280.22 or the corresponding state requirement, and the name and address of the facility.] This guarantee satisfies 40 CFR part 280, subpart H requirements for assuring funding for [insert: “taking corrective action” and/or “compensating third parties for bodily injury and property damage caused by” either “sudden accidental releases” or “nonsudden accidental releases” or “accidental releases”; if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location] arising from operating the above-identified underground storage tank(s) in the amount of [insert dollar amount] per occurrence and [insert dollar amount] annual aggregate.

(3) [Insert appropriate phrase: “On behalf of our subsidiary” (if guarantor is corporate parent of the owner or operator); “On behalf of our affiliate” (if guarantor is a related firm of the owner or operator); or “Incident to our business relationship with” (if guarantor is providing the guarantee as an incident to a substantial business relationship with owner or operator)] [owner or operator], guarantor guarantees to [implementing agency] and to any and all third parties that:

In the event that [owner or operator] fails to provide alternative coverage within 60 days after receipt of a notice of cancellation of this guarantee and the [Director of the implementing agency] has determined or suspects that a release has occurred at an underground storage tank covered by this guarantee, the guarantor, upon instructions from the [Director], shall fund a standby trust fund in accordance with the provisions of 40 CFR 280.108, in an amount not to exceed the coverage limits specified above.

In the event that the [Director] determines that [owner or operator] has failed to perform corrective action for releases arising out of the operation of the above-identified tank(s) in accordance with 40 CFR part 280, subpart F, the guarantor upon written instructions from the [Director] shall fund a standby trust in accordance with the provisions of 40 CFR 280.108, in an amount not to exceed the coverage limits specified above.

If [owner or operator] fails to satisfy a judgment or award based on a determination of liability for bodily injury or property damage to third parties caused by [“sudden” and/or “nonsudden”] accidential releases arising from the operation of the above-identified tank(s), or fails to pay an amount agreed to in settlement of a claim arising from or alleged to arise from such injury or damage, the guarantor, upon written instructions from the [Director], shall fund a standby trust in accordance with the provisions of 40 CFR 280.108 to satisfy such judgment(s), award(s), or settlement agreement(s) up to the limits of coverage specified above.

(4) Guarantor agrees that if, at the end of any fiscal year before cancellation of this guarantee, the guarantor fails to meet the financial test criteria of 40 CFR 280.95 (b) or (c) and (d), guarantor shall send within 120 days of such failure, by certified mail, notice to [owner or operator]. The guarantee will terminate 120 days from the date of receipt of the notice by [owner or operator], as evidenced by the return receipt.

(5) Guarantor agrees to notify [owner or operator] by certified mail of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code naming guarantor as debtor, within 10 days after commencement of the proceeding.

(6) Guarantor agrees to remain bound under this guarantee notwithstanding any modification or alteration of any obligation of [owner or operator] pursuant to 40 CFR part 280.

(7) Guarantor agrees to remain bound under this guarantee for so long as [owner or operator] must comply with the applicable financial responsibility requirements of 40 CFR part 280, subpart H for the above-identified tank(s), except that guarantor may cancel this guarantee by sending notice by certified mail to [owner or operator], such cancellation to become effective no earlier than 120 days after receipt of such notice by [owner or operator], as evidenced by the return receipt.

(8) The guarantor's obligation does not apply to any of the following:

(a) Any obligation of [insert owner or operator] under a workers' compensation, disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert owner or operator] arising from, and in the course of, employment by [insert owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, loaded to, in the care, custody, or control of, or occupied by [insert owner or operator] that is not the direct result of a release from a petroleum underground storage tank;

(e) Bodily damage or property damage for which [insert owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR 280.93.

(9) Guarantor expressly waives notice of acceptance of this guarantee by [the implementing agency], by any or all third parties, or by [owner or operator].

I hereby certify that the wording of this guarantee is identical to the wording specified in 40 CFR 280.96(c) as such regulations were constituted on the effective date shown immediately below.

Effective date:____________________

[Name of guarantor]

[Authorized signature for guarantor]

[Name of person signing]

[Title of person signing]

Signature of witness or notary:

____

(d) An owner or operator who uses a guarantee to satisfy the requirements of §280.93 must establish a standby trust fund when the guarantee is obtained. Under the terms of the guarantee, all amounts paid by the guarantor under the guarantee will be deposited directly into the standby trust fund in accordance with instructions from the Director of the implementing agency under §280.108. This standby trust fund must meet the requirements specified in §280.103.

§ 280.97 Insurance and risk retention group coverage.

(a) An owner or operator may satisfy the requirements of §290.93 by obtaining liability insurance that conforms to the requirements of this section from a qualified insurer or risk retention group. Such insurance may be in the form of a separate insurance policy or an endorsement to an existing insurance policy.

(b) Each insurance policy must be amended by an endorsement worded as specified in paragraph (b)(1) of this section, or evidenced by a certificate of insurance worded as specified in paragraph (b)(2) of this section, except that instructions in brackets must be replaced with the relevant information and the brackets deleted:

(1) Endorsement

Name: [name of each covered location]

____
____

Address: [address of each covered location]

____
____
Policy Number:____________________

Period of Coverage: [current policy period]

____
____

Name of [Insurer or Risk Retention Group]:

____
____

Address of [Insurer or Risk Retention Group]:

____
____
Name of Insured:____________________
Address of Insured:____________________
____
____

Endorsement:

1. This endorsement certifies that the policy to which the endorsement is attached provides liability insurance covering the following underground storage tanks:

[List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR 280.22, or the corresponding state requirement, and the name and address of the facility.]

for [insert: “taking corrective action” and/or “compensating third parties for bodily injury and property damage caused by” either “sudden accidental releases” or “nonsudden accidental releases” or “accidental releases”; in accordance with and subject to the limits of liability, exclusions, conditions, and other terms of the policy; if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location] arising from operating the underground storage tank(s) identified above.

The limits of liability are [insert the dollar amount of the “each occurrence” and “annual aggregate” limits of the Insurer's or Group's liability; if the amount of coverage is different for different types of coverage or for different underground storage tanks or locations, indicate the amount of coverage for each type of coverage and/or for each underground storage tank or location], exclusive of legal defense costs, which are subject to a separate limit under the policy. This coverage is provided under [policy number]. The effective date of said policy is [date].

2. The insurance afforded with respect to such occurrences is subject to all of the terms and conditions of the policy; provided, however, that any provisions inconsistent with subsections (a) through (e) of this Paragraph 2 are hereby amended to conform with subsections (a) through (e);

a. Bankruptcy or insolvency of the insured shall not relieve the [“Insurer” or “Group”] of its obligations under the policy to which this endorsement is attached.

b. The [“Insurer” or “Group”] is liable for the payment of amounts within any deductible applicable to the policy to the provider of corrective action or a damaged third-party, with a right of reimbursement by the insured for any such payment made by the [“Insurer” or “Group”]. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated under another mechanism or combination of mechanisms as specified in 40 CFR 280.95–280.102.

c. Whenever requested by [a Director of an implementing agency], the [“Insurer” or “Group”] agrees to furnish to [the Director] a signed duplicate original of the policy and all endorsements.

d. Cancellation or any other termination of the insurance by the [“Insurer” or “Group”], except for non-payment of premium or misrepresentation by the insured, will be effective only upon written notice and only after the expiration of 60 days after a copy of such written notice is received by the insured. Cancellation for non-payment of premium or misrepresentation by the insured will be effective only upon written notice and only after expiration of a minimum of 10 days after a copy of such written notice is received by the insured.

[Insert for claims-made policies:

e. The insurance covers claims otherwise covered by the policy that are reported to the [“Insurer” or “Group”] within six months of the effective date of cancellation or non-renewal of the policy except where the new or renewed policy has the same retroactive date or a retroactive date earlier than that of the prior policy, and which arise out of any covered occurrence that commenced after the policy retroactive date, if applicable, and prior to such policy renewal or termination date. Claims reported during such extended reporting period are subject to the terms, conditions, limits, including limits of liability, and exclusions of the policy.]

I hereby certify that the wording of this instrument is identical to the wording in 40 CFR 280.97(b)(1) and that the [“Insurer” or “Group”] is [“licensed to transact the business of insurance or eligible to provide insurance as an excess or surplus lines insurer in one or more states”].

[Signature of authorized representative of Insurer or Risk Retention Group]

[Name of person signing]

[Title of person signing], Authorized Representative of [name of Insurer or Risk Retention Group]

[Address of Representative]

(2) Certificate of Insurance

Name: [name of each covered location]

____
____

Address: [address of each covered location]

____
____
Policy Number:_____________________
Endorsement (if applicable):_____________________

Period of Coverage: [current policy period]

____

Name of [Insurer or Risk Retention Group]:

____
____

Address of [Insurer or Risk Retention Group]:

____
____
Name of Insured:_____________________

Address of Insured:

____
____
____

Certification:

1. [Name of Insurer or Risk Retention Group], [the "Insurer" or "Group"], as identified above, hereby certifies that it has issued liability insurance covering the following underground storage tank(s):

[List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR 280.22, or the corresponding state requirement, and the name and address of the facility.]

for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage caused by" either "sudden accidental releases" or "nonsudden accidental releases" or "accidental releases"; in accordance with and subject to the limits of liability, exclusions, conditions, and other terms of the policy; if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location] arising from operating the underground storage tank(s) identified above.

The limits of liability are [insert the dollar amount of the “each occurrence” and “annual aggregate” limits of the Insurer's or Group's liability; if the amount of coverage is different for different types of coverage or for different underground storage tanks or locations, indicate the amount of coverage for each type of coverage and/or for each underground storage tank or location], exclusive of legal defense costs, which are subject to a separate limit under the policy. This coverage is provided under [policy number]. The effective date of said policy is [date].

2. The [“Insurer” or “Group”] further certifies the following with respect to the insurance described in Paragraph 1:

a. Bankruptcy or insolvency of the insured shall not relieve the [“Insurer” or “Group”] of its obligations under the policy to which this certificate applies.

b. The [“Insurer” or “Group”] is liable for the payment of amounts within any deductible applicable to the policy to the provider of corrective action or a damaged third-party, with a right of reimbursement by the insured for any such payment made by the [“Insurer” or “Group”]. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated under another mechanism or combination of mechanisms as specified in 40 CFR 280.95–280.102.

c. Whenever requested by [a Director of an implementing agency], the [“Insurer” or “Group”] agrees to furnish to [the Director] a signed duplicate original of the policy and all endorsements.

d. Cancellation or any other termination of the insurance by the [“Insurer” or “Group”], except for non-payment of premium or misrepresentation by the insured, will be effective only upon written notice and only after the expiration of 60 days after a copy of such written notice is received by the insured. Cancellation for non-payment of premium or misrepresentation by the insured will be effective only upon written notice and only after expiration of a minimum of 10 days after a copy of such written notice is received by the insured.

[Insert for claims-made policies:

e. The insurance covers claims otherwise covered by the policy that are reported to the [“Insurer” or “Group”] within six months of the effective date of cancellation or non-renewal of the policy except where the new or renewed policy has the same retroactive date or a retroactive date earlier than that of the prior policy, and which arise out of any covered occurrence that commenced after the policy retroactive date, if applicable, and prior to such policy renewal or termination date. Claims reported during such extended reporting period are subject to the terms, conditions, limits, including limits of liability, and exclusions of the policy.]

I hereby certify that the wording of this instrument is identical to the wording in 40 CFR 280.97(b)(2) and that the [“Insurer” or “Group”] is [“licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more states”].

[Signature of authorized representative of Insurer]

[Type name]

[Title], Authorized Representative of [name of Insurer or Risk Retention Group]

[Address of Representative]

(c) Each insurance policy must be issued by an insurer or a risk retention group that, at a minimum, is licensed to transact the business of insurance or eligible to provide insurance as an excess or surplus lines insurer in one or more states.

[53 FR 43370, Oct. 26, 1988, as amended at 54 FR 47081, Nov. 9, 1989]

§ 280.98 Surety bond.

(a) An owner or operator may satisfy the requirements of §280.93 by obtaining a surety bond that conforms to the requirements of this section. The surety company issuing the bond must be among those listed as acceptable sureties on federal bonds in the latest Circular 570 of the U.S. Department of the Treasury.

(b) The surety bond must be worded as follows, except that instructions in brackets must be replaced with the relevant information and the brackets deleted:

Performance Bond

Date bond executed:____________________
Period of coverage:____________________

Principal: [legal name and business address of owner or operator]

____

Type of organization: [insert "individual," "joint venture," "partnership," or "corporation"]

____

State of incorporation (if applicable):

____

Surety(ies): [name(s) and business address(es)]

____

Scope of Coverage: [List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR 280.22, or the corresponding state requirement, and the name and address of the facility. List the coverage guaranteed by the bond: "taking corrective action" and/or "compensating third parties for bodily injury and property damage caused by" either "sudden accidental releases" or "nonsudden accidental releases” or “accidental releases” “arising from operating the underground storage tank”].

Penal sums of bond:

Per occurrence $____________________
Annual aggregate $____________________
Surety's bond number:____________________

Know All Persons by These Presents, that we, the Principal and Surety(ies), hereto are firmly bound to [the implementing agency], in the above penal sums for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally; provided that, where the Surety(ies) are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sums jointly and severally only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sums only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sums.

Whereas said Principal is required under Subtitle I of the Resource Conservation and Recovery Act (RCRA), as amended, to provide financial assurance for [insert: “taking corrective action” and/or “compensating third parties for bodily injury and property damage caused by” either “sudden accidental releases” or “nonsudden accidental releases” or “accidental releases”; if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location] arising from operating the underground storage tanks identified above, and

Whereas said Principal shall establish a standby trust fund as is required when a surety bond is used to provide such financial assurance;

Now, therefore, the conditions of the obligation are such that if the Principal shall faithfully [“take corrective action, in accordance with 40 CFR part 280, subpart F and the Director of the state implementing agency's instructions for,” and/or “compensate injured third parties for bodily injury and property damage caused by” either “sudden” or “nonsudden” or “sudden and nonsudden”] accidental releases arising from operating the tank(s) indentified above, or if the Principal shall provide alternate financial assurance, as specified in 40 CFR part 280, subpart H, within 120 days after the date the notice of cancellation is received by the Principal from the Surety(ies), then this obligation shall be null and void; otherwise it is to remain in full force and effect.

Such obligation does not apply to any of the following:

(a) Any obligation of [insert owner or operator] under a workers' compensation, disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert owner or operator] arising from, and in the course of, employment by [insert owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, loaned to, in the care, custody, or control of, or occupied by [insert owner or operator] that is not the direct result of a release from a petroleum underground storage tank;

(e) Bodily injury or property damage for which [insert owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR 280.93.

The Surety(ies) shall become liable on this bond obligation only when the Principal has failed to fulfill the conditions described above.

Upon notification by [the Director of the implementing agency] that the Principal has failed to ["take corrective action, in accordance with 40 CFR part 280, subpart F and the Director's instructions," and/or "compensate injured third parties"] as guaranteed by this bond, the Surety(ies) shall either perform ["corrective action in accordance with 40 CFR part 280 and the Director's instructions," and/or "third-party liability compensation"] or place funds in an amount up to the annual aggregate penal sum into the standby trust fund as directed by [the Regional Administrator or the Director] under 40 CFR 280.108.

Upon notification by [the Director] that the Principal has failed to provide alternate financial assurance within 60 days after the date the notice of cancellation is received by the Principal from the Surety(ies) and that [the Director] has determined or suspects that a release has occurred, the Surety(ies) shall place funds in an amount not exceeding the annual aggregate penal sum into the standby trust fund as directed by [the Director] under 40 CFR 280.108.

The Surety(ies) hereby waive(s) notification of amendments to applicable laws, statutes, rules, and regulations and agrees that no such amendment shall in any way alleviate its (their) obligation on this bond.

The liability of the Surety(ies) shall not be discharged by any payment or succession of payments hereunder, unless and until such payment or payments shall amount in the annual aggregate to the penal sum shown on the face of the bond, but in no event shall the obligation of the Surety(ies) hereunder exceed the amount of said annual aggregate penal sum.

The Surety(ies) may cancel the bond by sending notice of cancellation by certified mail to the Principal, provided, however, that cancellation shall not occur during the 120 days beginning on the date of receipt of the notice of cancellation by the Principal, as evidenced by the return receipt.

The Principal may terminate this bond by sending written notice to the Surety(ies).

In Witness Thereof, the Principal and Surety(ies) have executed this Bond and have affixed their seals on the date set forth above.

The persons whose signatures appear below hereby certify that they are authorized to execute this surety bond on behalf of the Principal and Surety(ies) and that the wording of this surety bond is identical to the wording specified in 40 CFR 280.98(b) as such regulations were constituted on the date this bond was executed.

Principal

[Signature(s)]

[Names(s)]

[Title(s)]

[Corporate seal]

Corporate Surety(ies)

[Name and address]

[State of Incorporation: _____

[Liability limit: $_____

[Signature(s)]

[Names(s) and title(s)]

[Corporate seal]

[For every co-surety, provide signature(s), corporate seal, and other information in the same manner as for Surety above.]

Bond premium: $_____

(c) Under the terms of the bond, the surety will become liable on the bond obligation when the owner or operator fails to perform as guaranteed by the bond. In all cases, the surety's liability is limited to the per-occurrence and annual aggregate penal sums.

(d) The owner or operator who uses a surety bond to satisfy the requirements of §280.93 must establish a standby trust fund when the surety bond is acquired. Under the terms of the bond, all amounts paid by the surety under the bond will be deposited directly into the standby trust fund in accordance with instructions from the Director under §280.108. This standby trust fund must meet the requirements specified in §280.103.

§ 280.99 Letter of credit.

(a) An owner or operator may satisfy the requirements of §280.93 by obtaining an irrevocable standby letter of credit that conforms to the requirements of this section. The issuing institution must be an entity that has the authority to issue letters of credit in each state where used and whose letter-of-credit operations are regulated and examined by a federal or state agency.

(b) The letter of credit must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

Irrevocable Standby Letter of Credit

[Name and address of issuing institution]

[Name and address of Director(s) of state implementing agency(ies)]

Dear Sir or Madam: We hereby establish our Irrevocable Standby Letter of Credit No. ___ in your favor, at the request and for the account of [owner or operator name] of [address] up to the aggregate amount of [in words] U.S. dollars ($[insert dollar amount]), available upon presentation [insert, if more than one Director of a state implementing agency is a beneficiary, "by any one of you"] of

(1) your sight draft, bearing reference to this letter of credit, No. ___, and

(2) your signed statement reading as follows: "I certify that the amount of the draft is payable persuant to regulations issued under authority of Subtitle I of the Resource Conservation and Recovery Act of 1976, as amended."

This letter of credit may be drawn on to cover [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage caused by" either "sudden accidental releases" or "nonsudden accidental releases" or "accidental releases"] arising from operating the underground storage tank(s) identified below in the amount of [in words] $[insert dollar amount] per occurrence and [in words] $[insert dollar amount] annual aggregate:

[List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR 280.22, or the corresponding state requirement, and the name and address of the facility.]

The letter of credit may not be drawn on to cover any of the following:

(a) Any obligation of [insert owner or operator] under a workers' compensation, disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert owner or operator] arising from, and in the course of, employment by [insert owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, loaned to, in the care, custody, or control of, or occupied by [insert owner or operator] that is not the direct result of a release from a petroleum underground storage tank;

(e) Bodily injury or property damage for which [insert owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR 280.93.

This letter of credit is effective as of [date] and shall expire on [date], but such expiration date shall be automatically extended for a period of [at least the length of the original term] on [expiration date] and on each successive expiration date, unless, at least 120 days before the curent expiration date, we notify [owner or operator] by certified mail that we have decided not to extend this letter of credit beyond the current expiration date. In the event that [owner or operator] is so notified, any unused portion of the credit shall be available upon presentation of your sight draft for 120 days after the date of receipt by [owner or operator], as shown on the signed return receipt.

Whenever this letter of credit is drawn on under and in compliance with the terms of this credit, we shall duly honor such draft upon presentation to us, and we shall deposit the amount of the draft directly into the standby trust fund of [owner or operator] in accordance with your instructions.

We certify that the wording of this letter of credit is identical to the wording specified in 40 CFR 280.99(b) as such regulations were constituted on the date shown immediately below.

[Signature(s) and title(s) of official(s) of issuing institution]

[Date]

This credit is subject to [insert “the most recent edition of the Uniform Customs and Practice for Documentary Credits, published and copyrighted by the International Chamber of Commerce,” or “the Uniform Commercial Code”].

(c) An owner or operator who uses a letter of credit to satisfy the requirements of §280.93 must also establish a standby trust fund when the letter of credit is acquired. Under the terms of the letter of credit, all amounts paid pursuant to a draft by the Director of the implementing agency will be deposited by the issuing institution directly into the standby trust fund in accordance with instructions from the Director under §280.108. This standby trust fund must meet the requirements specified in §280.103.

(d) The letter of credit must be irrevocable with a term specified by the issuing institution. The letter of credit must provide that credit be automatically renewed for the same term as the original term, unless, at least 120 days before the current expiration date, the issuing institution notifies the owner or operator by certified mail of its decision not to renew the letter of credit. Under the terms of the letter of credit, the 120 days will begin on the date when the owner or operator receives the notice, as evidenced by the return receipt.

[53 FR 37194, Sept. 23, 1988, as amended at 59 FR 29960, June 10, 1994]

§ 280.100 Use of state-required mechanism.

(a) For underground storage tanks located in a state that does not have an approved program, and where the state requires owners or operators of underground storage tanks to demonstrate financial responsibility for taking corrective action and/or for compensating third parties for bodily injury and property damage, an owner or operator may use a state-required financial mechanism to meet the requirements of §280.93 if the Regional Administrator determines that the state mechanism is at least equivalent to the financial mechanisms specified in this subpart.

(b) The Regional Administrator will evaluate the equivalency of a state-required mechanism principally in terms of: certainty of the availability of funds for taking corrective action and/or for compensating third parties; the amount of funds that will be made available; and the types of costs covered. The Regional Administrator may also consider other factors as is necessary.

(c) The state, an owner or operator, or any other interested party may submit to the Regional Administrator a written petition requesting that one or more of the state-required mechanisms be considered acceptable for meeting the requirements of §280.93. The submission must include copies of the appropriate state statutory and regulatory requirements and must show the amount of funds for corrective action and/or for compensating third parties assured by the mechanism(s). The Regional Administrator may require the petitioner to submit additional information as is deemed necessary to make this determination.

(d) Any petition under this section may be submitted on behalf of all of the state's underground storage tank owners and operators.

(e) The Regional Administrator will notify the petitioner of his determination regarding the mechanism's acceptability in lieu of financial mechanisms specified in this subpart. Pending this determination, the owners and operators using such mechanisms will be deemed to be in compliance with the requirements of §280.93 for underground storage tanks located in the state for the amounts and types of costs covered by such mechanisms.

[53 FR 43370, Oct. 26, 1988; 53 FR 51274, Dec. 21, 1988]

§ 280.101 State fund or other state assurance.

(a) An owner or operator may satisfy the requirements of §280.93 for underground storage tanks located in a state, where EPA is administering the requirements of this subpart, which assures that monies will be available from a state fund or state assurance program to cover costs up to the limits specified in §280.93 or otherwise assures that such costs will be paid if the Regional Administrator determines that the state's assurance is at least equivalent to the financial mechanisms specified in this subpart.

(b) The Regional Administrator will evaluate the equivalency of a state fund or other state assurance principally in terms of: Certainty of the availability of funds for taking corrective action and/or for compensating third parties; the amount of funds that will be made available; and the types of costs covered. The Regional Administrator may also consider other factors as is necessary.

(c) The state must submit to the Regional Administrator a description of the state fund or other state assurance to be supplied as financial assurance, along with a list of the classes of underground storage tanks to which the funds may be applied. The Regional Administrator may require the state to submit additional information as is deemed necessary to make a determination regarding the acceptability of the state fund or other state assurance. Pending the determination by the Regional Administrator, the owner or operator of a covered class of USTs will be deemed to be in compliance with the requirements of §280.93 for the amounts and types of costs covered by the state fund or other state assurance.

(d) The Regional Administrator will notify the state of his determination regarding the acceptability of the state's fund or other assurance in lieu of financial mechanisms specified in this subpart. Within 60 days after the Regional Administrator notifies a state that a state fund or other state assurance is acceptable, the state must provide to each owner or operator for which it is assuming financial responsibility a letter or certificate describing the nature of the state's assumption of responsibility. The letter or certificate from the state must include, or have attached to it, the following information: the facility's name and address and the amount of funds for corrective action and/or for compensating third parties that is assured by the state. The owner or operator must maintain this letter or certificate on file as proof of financial responsibility in accordance with §280.107(b)(5).

§ 280.102 Trust fund.

(a) An owner or operator may satisfy the requirements of §280.93 by establishing a trust fund that conforms to the requirements of this section. The trustee must be an entity that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal agency or an agency of the state in which the fund is established.

(b) The wording of the trust agreement must be identical to the wording specified in §280.103(b)(1), and must be accompanied by a formal certification of acknowledgement as specified in §280.103(b)(2).

(c) The trust fund, when established, must be funded for the full required amount of coverage, or funded for part of the required amount of coverage and used in combination with other mechanism(s) that provide the remaining required coverage.

(d) If the value of the trust fund is greater than the required amount of coverage, the owner or operator may submit a written request to the Director of the implementing agency for release of the excess.

(e) If other financial assurance as specified in this subpart is substituted for all or part of the trust fund, the owner or operator may submit a written request to the Director of the implementing agency for release of the excess.

(f) Within 60 days after receiving a request from the owner or operator for release of funds as specified in paragraph (d) or (e) of this section, the Director of the implementing agency will instruct the trustee to release to the owner or operator such funds as the Director specifies in writing.

§ 280.103 Standby trust fund.

(a) An owner or operator using any one of the mechanisms authorized by §§280.96, 280.98, or 280.99 must establish a standby trust fund when the mechanism is acquired. The trustee of the standby trust fund must be an entity that has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal agency or an agency of the state in which the fund is established.

(b)(1) The standby trust agreement, or trust agreement, must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

Trust Agreement

Trust agreement, the “Agreement,” entered into as of [date] by and between [name of the owner or operator], a [name of state] [insert “corporation,” “partnership,” “association,” or “proprietorship”], the “Grantor,” and [name of corporate trustee], [insert “Incorporated in the state of ___” or “a national bank”], the “Trustee.”

Whereas, the United States Environmental Protection Agency, “EPA,” an agency of the United States Government, has established certain regulations applicable to the Grantor, requiring that an owner or operator of an underground storage tank shall provide assurance that funds will be available when needed for corrective action and third-party compensation for bodily injury and property damage caused by sudden and nonsudden accidental releases arising from the operation of the underground storage tank. The attached Schedule A lists the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located that are covered by the standpoint trust agreement.

[Whereas, the Grantor has elected to establish [insert either “a guarantee,” “surety bond,” or “letter of credit”] to provide all or part of such financial assurance for the underground storage tanks identified herein and is required to establish a standby trust fund able to accept payments from the instrument (This paragraph is only applicable to the standby trust agreement.)];

Whereas, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this agreement, and the Trustee is willing to act as trustee;

Now, therefore, the Grantor and the Trustee agree as follows:

Section 1. Definitions

As used in this Agreement:

(a) The term “Grantor” means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor.

(b) The term “Trustee” means the Trustee who enters into this Agreement and any successor Trustee.

Section 2. Identification of the Financial Assurance Mechanism

This Agreement pertains to the [identify the financial assurance mechanism, either a guarantee, surety bond, or letter of credit, from which the standby trust fund is established to receive payments (This paragraph is only applicable to the standby trust agreement.)].

Section 3. Establishment of Fund

The Grantor and the Trustee hereby establish a trust fund, the “Fund,” for the benefit of [implementing agency]. The Grantor and the Trustee intend that no third party have access to the Fund except as herein provided. [The Fund is established initially as a standby to receive payments and shall not consist of any property.] Payments made by the provider of financial assurance pursuant to [the Director of the implementing agency's] instruction are transferred to the Trustee and are referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor as provider of financial assurance, any payments necessary to discharge any liability of the Grantor established by [the state implementing agency]

Section 4. Payment for [“Corrective Action” and/or Third-Party Liability Claims”]

The Trustee shall make payments from the Fund as [the Director of the implementing agency] shall direct, in writing, to provide for the payment of the costs of [insert: “taking corrective action” and/or compensating third parties for bodily injury and property damage caused by” either “sudden accidental releases” or “nonsudden accidental releases” or “accidental releases”] arising from operating the tanks covered by the financial assurance mechanism identified in this Agreement.

The Fund may not be drawn upon to cover any of the following:

(a) Any obligation of [insert owner or operator] under a workers' compensation, disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert owner or operator] arising from, and in the course of employment by [insert owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, loaned to, in the care, custody, or control of, or occupied by [insert owner or operator] that is not the direct result of a release from a petroleum underground storage tank;

(e) Bodily injury or property damage for which [insert owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR 280.93.

The Trustee shall reimburse the Grantor, or other persons as specified by [the Director], from the Fund for corrective action expenditures and/or third-party liability claims in such amounts as [the Director] shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts as [the Director] specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.

Section 5. Payments Comprising the Fund

Payments made to the Trustee for the Fund shall consist of cash and securities acceptable to the Trustee.

Section 6. Trustee Management

The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund solely in the interest of the beneficiaries and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:

(i) Securities or other obligations of the Grantor, or any other owner or operator of the tanks, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a–2(a), shall not be acquired or held, unless they are securities or other obligations of the federal or a state government;

(ii) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the federal or state government; and

(iii) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

Section 7. Commingling and Investment

The Trustee is expressly authorized in its discretion:

(a) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and

(b) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 80a–1 et seq., including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

Section 8. Express Powers of Trustee

Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;

(b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;

(d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the federal or state government; and

(e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses

All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Advice of Counsel

The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any questions arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

Section 11. Trustee Compensation

The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

Section 12. Successor Trustee

The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in writing sent to the Grantor and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

Section 13. Instructions to the Trustee

All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Schedule B or such other designees as the Grantor may designate by amendment to Schedule B. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. All orders, requests, and instructions by [the Director of the implementing agency] to the Trustee shall be in writing, signed by [the Director], and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or [the director] hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or [the Director], except as provided for herein.

Section 14. Amendment of Agreement

This Agreement may be amended by an instrument in writing executed by the Grantor and the Trustee, or by the Trustee and [the Director of the implementing agency] if the Grantor ceases to exist.

Section 15. Irrevocability and Termination

Subject to the right of the parties to amend this Agreement as provided in Section 14, this Trust shall be irrevocable and shall continue until terminated at the written direction of the Grantor and the Trustee, or by the Trustee and [the Director of the implementing agency], if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

Section 16. Immunity and Indemnification

The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or [the Director of the implementing agency] issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 17. Choice of Law

This Agreement shall be administered, construed, and enforced according to the laws of the state of [insert name of state], or the Comptroller of the Currency in the case of National Association banks.

Section 18. Interpretation

As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

In Witness whereof the parties have caused this Agreement to be executed by their respective officers duly authorized and their corporate seals (if applicable) to be hereunto affixed and attested as of the date first above written. The parties below certify that the wording of this Agreement is identical to the wording specified in 40 CFR 280.103(b)(1) as such regulations were constituted on the date written above.

[Signature of Grantor]

[Name of the Grantor]

[Title]

Attest:

[Signature of Trustee]

[Name of the Trustee]

[Title]

[Seal]

[Signature of Witness]

[Name of the Witness]

[Title]

[Seal]

(2) The standby trust agreement, or trust agreement must be accompanied by a formal certification of acknowledgement similar to the following. State requirements may differ on the proper content of this acknowledgment.

State of____________________
County of____________________

On this [date], before me personally came [owner or operator] to me known, who, being by me duly sworn, did depose and say that she/he resides at [address], that she/he is [title] of [corporation], the corporation described in and which executed the above instrument; that she/he knows the seal of said corporation; that the seal affixed to such instrument is such corporate seal;

that it was so affixed by order of the Board of Directors of said corporation; and that she/he signed her/his name thereto by like order.

[Signature of Notary Public]

[Name of Notary Public]

(c) The Director of the implementing agency will instruct the trustee to refund the balance of the standby trust fund to the provider of financial assurance if the Director determines that no additional corrective action costs or third-party liability claims will occur as a result of a release covered by the financial assurance mechanism for which the standby trust fund was established.

(d) An owner or operator may establish one trust fund as the depository mechanism for all funds assured in compliance with this rule.

[53 FR 43370, Oct. 26, 1988; 53 FR 51274, Dec. 21, 1988]

§ 280.104 Local government bond rating test.

(a) A general purpose local government owner or operator and/or local government serving as a guarantor may satisfy the requirements of §280.93 by having a currently outstanding issue or issues of general obligation bonds of $1 million or more, excluding refunded obligations, with a Moody's rating of Aaa, Aa, A, or Baa, or a Standard & Poor's rating of AAA, AA, A, or BBB. Where a local government has multiple outstanding issues, or where a local government's bonds are rated by both Moody's and Standard and Poor's, the lowest rating must be used to determine eligibility. Bonds that are backed by credit enhancement other than municipal bond insurance may not be considered in determining the amount of applicable bonds outstanding.

(b) A local government owner or operator or local government serving as a guarantor that is not a general-purpose local government and does not have the legal authority to issue general obligation bonds may satisfy the requirements of §280.93 by having a currently outstanding issue or issues of revenue bonds of $1 million or more, excluding refunded issues and by also having a Moody's rating of Aaa, A, A, or Baa, or a Standard & Poor's rating of AAA, AA, A, or BBB as the lowest rating for any rated revenue bond issued by the local government. Where bonds are rated by both Moody's and Standard & Poor's, the lower rating for each bond must be used to determine eligibility. Bonds that are backed by credit enhancement may not be considered in determining the amount of applicable bonds outstanding.

(c) The local government owner or operator and/or guarantor must maintain a copy of its bond rating published within the last 12 months by Moody's or Standard & Poor's.

(d) To demonstrate that it meets the local government bond rating test, the chief financial officer of a general purpose local government owner or operator and/or guarantor must sign a letter worded exactly as follows, except that the instructions in brackets are to be replaced by the relevant information and the brackets deleted:

Letter from Chief Financial Officer

I am the chief financial officer of [insert: name and address of local government owner or operator, or guarantor]. This letter is in support of the use of the bond rating test to demonstrate financial responsibility for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage"] caused by [insert: "sudden accidental releases" and/or "nonsudden accidental releases"] in the amount of at least [insert: dollar amount] per occurrence and [insert: dollar amount] annual aggregate arising from operating (an) underground storage tank(s).

Underground storage tanks at the following facilities are assured by this bond rating test: [List for each facility: the name and address of the facility where tanks are assured by the bond rating test].

The details of the issue date, maturity, outstanding amount, bond rating, and bond rating agency of all outstanding bond issues that are being used by [name of local government owner or operator, or guarantor] to demonstrate financial responsibility are as follows: [complete table]

Issue date	Maturity date	Outstanding amount	Bond rating	Rating agency
				[Moody's or Standard & Poor's]

The total outstanding obligation of [insert amount], excluding refunded bond issues, exceeds the minimum amount of $1 million. All outstanding general obligation bonds issued by this government that have been rated by Moody's or Standard & Poor's are rated as at least investment grade (Moody's Baa or Standard & Poor's BBB) based on the most recent ratings published within the last 12 months. Neither rating service has provided notification within the last 12 months of downgrading of bond ratings below investment grade or of withdrawal of bond rating other than for repayment of outstanding bond issues.

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR Part 280.104(d) as such regulations were constituted on the date shown immediately below.

[Date]____________________
[Signature]____________________
[Name]____________________
[Title]____________________

(e) To demonstrate that it meets the local government bond rating test, the chief financial officer of local government owner or operator and/or guarantor other than a general purpose government must sign a letter worded exactly as follows, except that the instructions in brackets are to be replaced by the relevant information and the brackets deleted:

Letter from Chief Financial Officer

I am the chief financial officer of [insert: name and address of local government owner or operator, or guarantor]. This letter is in support of the use of the bond rating test to demonstrate financial responsibility for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage"] caused by [insert : "sudden accidental releases" and/or "nonsudden accidental releases"] in the amount of at least [insert: dollar amount] per occurrence and [insert: dollar amount] annual aggregate arising from operating (an) underground storage tank(s). This local government is not organized to provide general governmental services and does not have the legal authority under state law or constitutional provisions to issue general obligation debt.

Underground storage tanks at the following facilities are assured by this bond rating test: [List for each facility: the name and address of the facility where tanks are assured by the bond rating test].

The details of the issue date, maturity, outstanding amount, bond rating, and bond rating agency of all outstanding revenue bond issues that are being used by [name of local government owner or operator, or guarantor] to demonstrate financial responsibility are as follows: [complete table]

Issue date	Maturity date	Outstanding amount	Bond rating	Rating agency
				[Moody's or Standard & Poor's]

The total outstanding obligation of [insert amount], excluding refunded bond issues, exceeds the minimum amount of $1 million. All outstanding revenue bonds issued by this government that have been rated by Moody's or Standard & Poor's are rated as at least investment grade (Moody's Baa or Standard & Poor's BBB) based on the most recent ratings published within the last 12 months. The revenue bonds listed are not backed by third-party credit enhancement or are insured by a municipal bond insurance company. Neither rating service has provided notification within the last 12 months of downgrading of bond ratings below investment grade or of withdrawal of bond rating other than for repayment of outstanding bond issues.

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR part 280.104(e) as such regulations were constituted on the date shown immediately below.

[Date]____________________
[Signature]____________________
[Name]____________________
[Title]____________________

(f) The Director of the implementing agency may require reports of financial condition at any time from the local government owner or operator, and/or local government guarantor. If the Director finds, on the basis of such reports or other information, that the local government owner or operator, and/or guarantor, no longer meets the local government bond rating test requirements of §280.104, the local government owner or operator must obtain alternative coverage within 30 days after notification of such a finding.

(g) If a local government owner or operator using the bond rating test to provide financial assurance finds that it no longer meets the bond rating test requirements, the local government owner or operator must obtain alternative coverage within 150 days of the change in status.

[58 FR 9053, Feb. 18, 1993]

§ 280.105 Local government financial test.

(a) A local government owner or operator may satisfy the requirements of §280.93 by passing the financial test specified in this section. To be eligible to use the financial test, the local government owner or operator must have the ability and authority to assess and levy taxes or to freely establish fees and charges. To pass the local government financial test, the owner or operator must meet the criteria of paragraphs (b)(2) and (b)(3) of this section based on year-end financial statements for the latest completed fiscal year.

(b)(1) The local government owner or operator must have the following information available, as shown in the year-end financial statements for the latest completed fiscal year:

(i) *Total revenues:* Consists of the sum of general fund operating and non-operating revenues including net local taxes, licenses and permits, fines and forfeitures, revenues from use of money and property, charges for services, investment earnings, sales (property, publications, etc.), intergovernmental revenues (restricted and unrestricted), and total revenues from all other governmental funds including enterprise, debt service, capital projects, and special revenues, but excluding revenues to funds held in a trust or agency capacity. For purposes of this test, the calculation of total revenues shall exclude all transfers between funds under the direct control of the local government using the financial test (interfund transfers), liquidation of investments, and issuance of debt.

(ii) *Total expenditures:* Consists of the sum of general fund operating and non-operating expenditures including public safety, public utilities, transportation, public works, environmental protection, cultural and recreational, community development, revenue sharing, employee benefits and compensation, office management, planning and zoning, capital projects, interest payments on debt, payments for retirement of debt principal, and total expenditures from all other governmental funds including enterprise, debt service, capital projects, and special revenues. For purposes of this test, the calculation of total expenditures shall exclude all transfers between funds under the direct control of the local government using the financial test (interfund transfers).

(iii) *Local revenues:* Consists of total revenues (as defined in paragraph (b)(1)(i) of this section) minus the sum of all transfers from other governmental entities, including all monies received from Federal, state, or local government sources.

(iv) *Debt service:* Consists of the sum of all interest and principal payments on all long-term credit obligations and all interest-bearing short-term credit obligations. Includes interest and principal payments on general obligation bonds, revenue bonds, notes, mortgages, judgments, and interest bearing warrants. Excludes payments on non-interest-bearing short-term obligations, interfund obligations, amounts owed in a trust or agency capacity, and advances and contingent loans from other governments.

(v) *Total funds:* Consists of the sum of cash and investment securities from all funds, including general, enterprise, debt service, capital projects, and special revenue funds, but excluding employee retirement funds, at the end of the local government's financial reporting year. Includes Federal securities, Federal agency securities, state and local government securities, and other securities such as bonds, notes and mortgages. For purposes of this test, the calculation of total funds shall exclude agency funds, private trust funds, accounts receivable, value of real property, and other non-security assets.

(vi) *Population* consists of the number of people in the area served by the local government.

(2) The local government's year-end financial statements, if independently audited, cannot include an adverse auditor's opinion or a disclaimer of opinion. The local government cannot have outstanding issues of general obligation or revenue bonds that are rated as less than investment grade.

(3) The local government owner or operator must have a letter signed by the chief financial officer worded as specified in paragraph (c) of this section.

(c) To demonstrate that it meets the financial test under paragraph (b) of this section, the chief financial officer of the local government owner or operator, must sign, within 120 days of the close of each financial reporting year, as defined by the twelve-month period for which financial statements used to support the financial test are prepared, a letter worded exactly as follows, except that the instructions in brackets are to be replaced by the relevant information and the brackets deleted:

Letter From Chief Financial Officer

I am the chief financial officer of [insert: name and address of the owner or operator]. This letter is in support of the use of the local government financial test to demonstrate financial responsibility for [insert: “taking corrective action” and/or “compensating third parties for bodily injury and property damage”] caused by [insert: “sudden accidental releases” and/or “nonsudden accidental releases”] in the amount of at least [insert: dollar amount] per occurrence and [insert: dollar amount] annual aggregate arising from operating [an] underground storage tank[s].

Underground storage tanks at the following facilities are assured by this financial test [List for each facility: the name and address of the facility where tanks assured by this financial test are located. If separate mechanisms or combinations of mechanisms are being used to assure any of the tanks at this facility, list each tank assured by this financial test by the tank identification number provided in the notification submitted pursuant to 40 CFR Part 280.22 or the corresponding state requirements.]

This owner or operator has not received an adverse opinion, or a disclaimer of opinion from an independent auditor on its financial statements for the latest completed fiscal year. Any outstanding issues of general obligation or revenue bonds, if rated, have a Moody's rating of Aaa, Aa, A, or Baa or a Standard and Poor's rating of AAA, AA, A, or BBB; if rated by both firms, the bonds have a Moody's rating of Aaa, Aa, A, or Baa and a Standard and Poor's rating of AAA, AA, A, or BBB.

Worksheet for Municipal Financial Test

Part I: Basic Information

1. Total Revenues

a. Revenues (dollars) ______

Value of revenues excludes liquidation of investments and issuance of debt. Value includes all general fund operating and non-operating revenues, as well as all revenues from all other governmental funds including enterprise, debt service, capital projects, and special revenues, but excluding revenues to funds held in a trust or agency capacity.

b. Subtract interfund transfers (dollars)______

c. Total Revenues (dollars)______

2. Total Expenditures

a. Expenditures (dollars) ______

Value consists of the sum of general fund operating and non-operating expenditures including interest payments on debt, payments for retirement of debt principal, and total expenditures from all other governmental funds including enterprise, debt service, capital projects, and special revenues.

b. Subtract interfund transfers (dollars)______

c. Total Expenditures (dollars)______

3. Local Revenues

a. Total Revenues (from 1c) (dollars) ______

b. Subtract total intergovernmental transfers (dollars)______

c. Local Revenues (dollars)______

4. Debt Service

a. Interest and fiscal charges (dollars)______

b. Add debt retirement (dollars)______

c. Total Debt Service (dollars)______

5. Total Funds (Dollars)______

(Sum of amounts held as cash and investment securities from all funds, excluding amounts held for employee retirement funds, agency funds, and trust funds)

6. Population (Persons)______

Part II: Application of Test

7. Total Revenues to Population

a. Total Revenues (from 1c)______

b. Population (from 6)______

c. Divide 7a by 7b ______

d. Subtract 417______

e. Divide by 5,212______

f. Multiply by 4.095______

8. Total Expenses to Population

a. Total Expenses (from 2c)______

b. Population (from 6)______

c. Divide 8a by 8b ______

d. Subtract 524 ______

e. Divide by 5,401______

f. Multiply by 4.095______

9. Local Revenues to Total Revenues

a. Local Revenues (from 3c)______

b. Total Revenues (from 1c)______

c. Divide 9a by 9b ______

d. Subtract .695______

e. Divide by .205______

f. Multiply by 2.840 ______

10. Debt Service to Population

a. Debt Service (from 4d) ______

b. Population (from 6)______

c. Divide 10a by 10b ______

d. Subtract 51 ______

e. Divide by 1,038______

f. Multiply by −1.866______

11. Debt Service to Total Revenues

a. Debt Service (from 4d)______

b. Total Revenues (from 1c)______

c. Divide 11a by 11b ______

d. Subtract .068 ______

e. Divide by .259 ______

f. Multiply by −3.533 ______

12. Total Revenues to Total Expenses

a. Total Revenues (from 1c)______

b. Total Expenses (from 2c)______

c. Divide 12a by 12b______

d. Subtract .910 ______

e. Divide by .899 ______

f. Multiply by 3.458 ______

13. Funds Balance to Total Revenues

a. Total Funds (from 5) ______

b. Total Revenues (from 1c)______

c. Divide 13a by 13b ______

d. Subtract .891 ______

e. Divide by 9.156______

f. Multiply by 3.270 ______

14. Funds Balance to Total Expenses

a. Total Funds (from 5)______

b. Total Expenses (from 2c)______

c. Divide 14a by 14b______

d. Subtract .866 ______

e. Divide by 6.409 ______

f. Multiply by 3.270 ______

15. Total Funds to Population ______

a. Total Funds (from 5) ______

b. Population (from 6)______

c. Divide 15a by 15b ______

d. Subtract 270 ______

e. Divide by 4,548 ______

f. Multiply by 1.866 ______

16. Add 7f + 8f + 9f + 10f + 11f + 12f + 13f + 14f + 15f + 4.937______

I hereby certify that the financial index shown on line 16 of the worksheet is greater than zero and that the wording of this letter is identical to the wording specified in 40 CFR part 280.105(c) as such regulations were constituted on the date shown immediately below.

[Date]

[Signature]

[Name]

[Title]

(d) If a local government owner or operator using the test to provide financial assurance finds that it no longer meets the requirements of the financial test based on the year-end financial statements, the owner or operator must obtain alternative coverage within 150 days of the end of the year for which financial statements have been prepared.

(e) The Director of the implementing agency may require reports of financial condition at any time from the local government owner or operator. If the Director finds, on the basis of such reports or other information, that the local government owner or operator no longer meets the financial test requirements of §280.105 (b) and (c), the owner or operator must obtain alternate coverage within 30 days after notification of such a finding.

(f) If the local government owner or operator fails to obtain alternate assurance within 150 days of finding that it no longer meets the requirements of the financial test based on the year-end financial statements or within 30 days of notification by the Director of the implementing agency that it no longer meets the requirements of the financial test, the owner or operator must notify the Director of such failure within 10 days.

[58 FR 9054, Feb. 18, 1993]

§ 280.106   Local government guarantee.

(a) A local government owner or operator may satisfy the requirements of §280.93 by obtaining a guarantee that conforms to the requirements of this section. The guarantor must be either the state in which the local government owner or operator is located or a local government having a “substantial governmental relationship” with the owner and operator and issuing the guarantee as an act incident to that relationship. A local government acting as the guarantor must:

(1) demonstrate that it meets the bond rating test requirement of §280.104 and deliver a copy of the chief financial officer's letter as contained in §280.104(c) to the local government owner or operator; or

(2) demonstrate that it meets the worksheet test requirements of §280.105 and deliver a copy of the chief financial officer's letter as contained in §280.105(c) to the local government owner or operator; or

(3) demonstrate that it meets the local government fund requirements of §280.107(a), §280.107(b), or §280.107(c) and deliver a copy of the chief financial officer's letter as contained in §280.107 to the local government owner or operator.

(b) If the local government guarantor is unable to demonstrate financial assurance under any of §§280.104, 280.105, 280.107(a), 280.107(b), or 280.107(c), at the end of the financial reporting year, the guarantor shall send by certified mail, before cancellation or non-renewal of the guarantee, notice to the owner or operator. The guarantee will terminate no less than 120 days after the date the owner or operator receives the notification, as evidenced by the return receipt. The owner or operator must obtain alternative coverage as specified in §280.114(c).

(c) The guarantee agreement must be worded as specified in paragraph (d) or (e) of this section, depending on which of the following alternative guarantee arrangements is selected:

(1) If, in the default or incapacity of the owner or operator, the guarantor guarantees to fund a standby trust as directed by the Director of the implementing agency, the guarantee shall be worded as specified in paragraph (d) of this section.

(2) If, in the default or incapacity of the owner or operator, the guarantor guarantees to make payments as directed by the Director of the implementing agency for taking corrective action or compensating third parties for bodily injury and property damage, the guarantee shall be worded as specified in paragraph (e) of this section.

(d) If the guarantor is a state, the local government guarantee with standby trust must be worded exactly as follows, except that instructions in brackets are to be replaced with relevant information and the brackets deleted:

Local Government Guarantee With Standby Trust Made by a State

Guarantee made this [date] by [name of state], herein referred to as guarantor, to [the state implementing agency] and to any and all third parties, and obliges, on behalf of [local government owner or operator].

Recitals

(1) Guarantor is a state.

(2) [Local government owner or operator] owns or operates the following underground storage tank(s) covered by this guarantee: [List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR part 280 or the corresponding state requirement, and the name and address of the facility.] This guarantee satisfies 40 CFR part 280, subpart H requirements for assuring funding for [insert: “taking corrective action” and/or “compensating third parties for bodily injury and property damage caused by” either “sudden accidental releases” or “nonsudden accidental releases” or “accidental releases”; if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location] arising from operating the above-identified underground storage tank(s) in the amount of [insert dollar amount] per occurrence and [insert dollar amount] annual aggregate.

(3) Guarantor guarantees to [implementing agency] and to any and all third parties that:

In the event that [local government owner or operator] fails to provide alternative coverage within 60 days after receipt of a notice of cancellation of this guarantee and the [Director of the implementing agency] has determined or suspects that a release has occurred at an underground storage tank covered by this guarantee, the guarantor, upon instructions from the [Director] shall fund a standby trust fund in accordance with the provisions of 40 CFR part 280.112, in an amount not to exceed the coverage limits specified above.

In the event that the [Director] determines that [local government owner or operator] has failed to perform corrective action for releases arising out of the operation of the above-identified tank(s) in accordance with 40 CFR part 280, subpart F, the guarantor upon written instructions from the [Director] shall fund a standby trust fund in accordance with the provisions of 40 CFR part 280.112, in an amount not to exceed the coverage limits specified above.

If [owner or operator] fails to satisfy a judgment or award based on a determination of liability for bodily injury or property damage to third parties caused by [”sudden” and/or “nonsudden”] accidental releases arising from the operation of the above-identified tank(s), or fails to pay an amount agreed to in settlement of a claim arising from or alleged to arise from such injury or damage, the guarantor, upon written instructions from the [Director], shall fund a standby trust in accordance with the provisions of 40 CFR part 280.112 to satisfy such judgment(s), award(s), or settlement agreement(s) up to the limits of coverage specified above.

(4) Guarantor agrees to notify [owner or operator] by certified mail of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code naming guarantor as debtor, within 10 days after commencement of the proceeding.

(5) Guarantor agrees to remain bound under this guarantee notwithstanding any modification or alteration of any obligation of [owner or operator] pursuant to 40 CFR part 280.

(6) Guarantor agrees to remain bound under this guarantee for so long as [local government owner or operator] must comply with the applicable financial responsibility requirements of 40 CFR part 280, subpart H for the above identified tank(s), except that guarantor may cancel this guarantee by sending notice by certified mail to [owner or operator], such cancellation to become effective no earlier than 120 days after receipt of such notice by [owner or operator], as evidenced by the return receipt.

(7) The guarantor's obligation does not apply to any of the following:

(a) Any obligation of [local government owner or operator] under a workers' compensation, disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert: local government owner or operator] arising from, and in the course of, employment by [insert: local government owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, loaded to, in the care, custody, or control of, or occupied by [insert: local government owner or operator] that is not the direct result of a release from a petroleum underground storage tank;

(e) Bodily damage or property damage for which [insert owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR part 280.93.

(8) Guarantor expressly waives notice of acceptance of this guarantee by [the implementing agency], by any or all third parties, or by [local government owner or operator],

I hereby certify that the wording of this guarantee is identical to the wording specified in 40 CFR part 280.106(d) as such regulations were constituted on the effective date shown immediately below.

Effective date:____________________

[Name of guarantor]

[Authorized signature for guarantor]

[Name of person signing]

[Title of person signing]

Signature of witness or notary:

If the guarantor is a local government, the local government guarantee with standby trust must be worded exactly as follows, except that instructions in brackets are to be replaced with relevant information and the brackets deleted:

Local Government Guarantee With Standby Trust Made by a Local Government

Guarantee made this [date] by [name of guaranteeing entity], a local government organized under the laws of [name of state], herein referred to as guarantor, to [the state implementing agency] and to any and all third parties, and obliges, on behalf of [local government owner or operator].

Recitals

(1) Guarantor meets or exceeds [select one: the local government bond rating test requirements of 40 CFR part 280.104, the local government financial test requirements of 40 CFR part 280.105, or the local government fund under 40 CFR part 280.107(a), 280.107(b), or 280.107(c)].

(2) [Local government owner or operator] owns or operates the following underground storage tank(s) covered by this guarantee: [List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR part 280 or the corresponding state requirement, and the name and address of the facility.] This guarantee satisfies 40 CFR part 280, subpart H requirements for assuring funding for [insert: “taking corrective action” and/or “compensating third parties for bodily injury and property damage caused by” either “sudden accidental releases” or “nonsudden accidental releases” or “accidental releases”; if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location] arising from operating the above-identified underground storage tank(s) in the amount of [insert dollar amount] per occurrence and [insert: dollar amount] annual aggregate.

(3) Incident to our substantial governmental relationship with [local government owner or operator], guarantor guarantees to [implementing agency] and to any and all third parties that:

In the event that [local government owner or operator] fails to provide alternative coverage within 60 days after receipt of a notice of cancellation of this guarantee and the [Director of the implementing agency] has determined or suspects that a release has occurred at an underground storage tank covered by this guarantee, the guarantor, upon instructions from the [Director] shall fund a standby trust fund in accordance with the provisions of 40 CFR part 280.112, in an amount not to exceed the coverage limits specified above.

In the event that the [Director] determines that [local government owner or operator] has failed to perform corrective action for releases arising out of the operation of the above-identified tank(s) in accordance with 40 CFR part 280, subpart F, the guarantor upon written instructions from the [Director] shall fund a standby trust fund in accordance with the provisions of 40 CFR part 280.112, in an amount not to exceed the coverage limits specified above.

If [owner or operator] fails to satisfy a judgment or award based on a determination of liability for bodily injury or property damage to third parties caused by [“sudden” and/or “nonsudden”] accidental releases arising from the operation of the above-identified tank(s), or fails to pay an amount agreed to in settlement of a claim arising from or alleged to arise from such injury or damage, the guarantor, upon written instructions from the [Director], shall fund a standby trust in accordance with the provisions of 40 CFR part 280.112 to satisfy such judgment(s), award(s), or settlement agreement(s) up to the limits of coverage specified above.

(4) Guarantor agrees that, if at the end of any fiscal year before cancellation of this guarantee, the guarantor fails to meet or exceed the requirements of the financial responsibility mechanism specified in paragraph (1), guarantor shall send within 120 days of such failure, by certified mail, notice to [local government owner or operator], as evidenced by the return receipt.

(5) Guarantor agrees to notify [owner or operator] by certified mail of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code naming guarantor as debtor, within 10 days after commencement of the proceeding.

(6) Guarantor agrees to remain bound under this guarantee notwithstanding any modification or alteration of any obligation of [owner or operator] pursuant to 40 CFR part 280.

(7) Guarantor agrees to remain bound under this guarantee for so long as [local government owner or operator] must comply with the applicable financial responsibility requirements of 40 CFR part 280, subpart H for the above identified tank(s), except that guarantor may cancel this guarantee by sending notice by certified mail to [owner or operator], such cancellation to become effective no earlier than 120 days after receipt of such notice by [owner or operator], as evidenced by the return receipt.

(8) The guarantor's obligation does not apply to any of the following:

(a) Any obligation of [local government owner or operator] under a workers' compensation, disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert: local government owner or operator] arising from, and in the course of, employment by [insert: local government owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, loaned to, in the care, custody, or control of, or occupied by [insert: local government owner or operator] that is not the direct result of a release from a petroleum underground storage tank;

(e) Bodily damage or property damage for which [insert: owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR part 280.93.

(9) Guarantor expressly waives notice of acceptance of this guarantee by [the implementing agency], by any or all third parties, or by [local government owner or operator].

I hereby certify that the wording of this guarantee is identical to the wording specified in 40 CFR part 280.106(d) as such regulations were constituted on the effective date shown immediately below.

Effective date:____________________

[Name of guarantor]

[Authorized signature for guarantor]

[Name of person signing]

[Title of person signing]

Signature of witness or notary:

____

(e) If the guarantor is a state, the local government guarantee without standby trust must be worded exactly as follows, except that instructions in brackets are to be replaced with relevant information and the brackets deleted:

Local Government Guarantee Without Standby Trust Made by a State

Guarantee made this [date] by [name of state], herein referred to as guarantor, to [the state implementing agency] and to any and all third parties, and obliges, on behalf of [local government owner or operator].

Recitals

(1) Guarantor is a state.

(2) [Local government owner or operator] owns or operates the following underground storage tank(s) covered by this guarantee: [List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR part 280 or the corresponding state requirement, and the name and address of the facility.] This guarantee satisfies 40 CFR part 280, subpart H requirements for assuring funding for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage caused by" either "sudden accidental releases" or "nonsudden accidental releases" or "accidental releases"; if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location] arising from operating the above-identified underground storage tank(s) in the amount of [insert: dollar amount] per occurrence and [insert: dollar amount] annual aggregate.

(3) Guarantor guarantees to [implementing agency] and to any and all third parties and obliges that:

In the event that [local government owner or operator] fails to provide alternative coverage within 60 days after receipt of a notice of cancellation of this guarantee and the [Director of the implementing agency] has determined or suspects that a release has occurred at an underground storage tank covered by this guarantee, the guarantor, upon written instructions from the [Director] shall make funds available to pay for corrective actions and compensate third parties for bodily injury and property damage in an amount not to exceed the coverage limits specified above.

In the event that the [Director] determines that [local government owner or operator] has failed to perform corrective action for releases arising out of the operation of the above-identified tank(s) in accordance with 40 CFR part 280, subpart F, the guarantor upon written instructions from the [Director] shall make funds available to pay for corrective actions in an amount not to exceed the coverage limits specified above.

If [owner or operator] fails to satisfy a judgment or award based on a determination of liability for bodily injury or property damage to third parties caused by ["sudden" and/or "nonsudden"] accidental releases arising from the operation of the above-identified tank(s), or fails to pay an amount agreed to in settlement of a claim arising from or alleged to arise from such injury or damage, the guarantor, upon written instructions from the [Director], shall make funds available to compensate third parties for bodily injury and property damage in an amount not to exceed the coverage limits specified above.

(4) Guarantor agrees to notify [owner or operator] by certified mail of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code naming guarantor as debtor, within 10 days after commencement of the proceeding.

(5) Guarantor agrees to remain bound under this guarantee notwithstanding any modification or alteration of any obligation of [owner or operator] pursuant to 40 CFR part 280.

(6) Guarantor agrees to remain bound under this guarantee for so long as [local government owner or operator] must comply with the applicable financial responsibility requirements of 40 CFR part 280, subpart H for the above identified tank(s), except that guarantor may cancel this guarantee by sending notice by certified mail to [owner or operator], such cancellation to become effective no earlier than 120 days after receipt of such notice by [owner or operator], as evidenced by the return receipt. If notified of a probable release, the guarantor agrees to remain bound to the terms of this guarantee for all charges arising from the release, up to the coverage limits specified above, notwithstanding the cancellation of the guarantee with respect to future releases.

(7) The guarantor's obligation does not apply to any of the following:

(a) Any obligation of [local government owner or operator] under a workers' compensation disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert local government owner or operator] arising from, and in the course of, employment by [insert: local government owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, loaded to, in the care, custody, or control of, or occupied by [insert: local government owner or operator] that is not the direct result of a release from a petroleum underground storage tank;

(e) Bodily damage or property damage for which [insert: owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR part 280.93.

(8) Guarantor expressly waives notice of acceptance of this guarantee by [the implementing agency], by any or all third parties, or by [local government owner or operator].

I hereby certify that the wording of this guarantee is identical to the wording specified in 40 CFR part 280.106(e) as such regulations were constituted on the effective date shown immediately below.

Effective date:____________________

[Name of guarantor]

[Authorized signature for guarantor]

[Name of person signing]

[Title of person signing]

Signature of witness or notary:

If the guarantor is a local government, the local government guarantee without standby trust must be worded exactly as follows, except that instructions in brackets are to be replaced with relevant information and the brackets deleted:

Local Government Guarantee Without Standby Trust Made by a Local Government

Guarantee made this [date] by [name of guaranteeing entity], a local government organized under the laws of [name of state], herein referred to as guarantor, to [the state implementing agency] and to any and all third parties, and obliges, on behalf of [local government owner or operator].

Recitals

(1) Guarantor meets or exceeds [select one: the local government bond rating test requirements of 40 CFR part 280.104, the local government financial test requirements of 40 part CFR 280.105, the local government fund under 40 CFR part 280.107(a), 280.107(b), or 280.107(c).

(2) [Local government owner or operator] owns or operates the following underground storage tank(s) covered by this guarantee: [List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR part 280 or the corresponding state requirement, and the name and address of the facility.] This guarantee satisfies 40 CFR part 280, subpart H requirements for assuring funding for [insert: “taking corrective action” and/or “compensating third parties for bodily injury and property damage caused by” either “sudden accidental releases” or “nonsudden accidental releases” or “accidental releases”; if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location] arising from operating the above-identified underground storage tank(s) in the amount of [insert: dollar amount] per occurrence and [insert: dollar amount] annual aggregate.

(3) Incident to our substantial governmental relationship with [local government owner or operator], guarantor guarantees to [implementing agency] and to any and all third parties and obliges that:

In the event that [local government owner or operator] fails to provide alternative coverage within 60 days after receipt of a notice of cancellation of this guarantee and the [Director of the implementing agency] has determined or suspects that a release has occurred at an underground storage tank covered by this guarantee, the guarantor, upon written instructions from the [Director] shall make funds available to pay for corrective actions and compensate third parties for bodily injury and property damage in an amount not to exceed the coverage limits specified above.

In the event that the [Director] determines that [local government owner or operator] has failed to perform corrective action for releases arising out of the operation of the above-identified tank(s) in accordance with 40 CFR part 280, subpart F, the guarantor upon written instructions from the [Director] shall make funds available to pay for corrective actions in an amount not to exceed the coverage limits specified above.

If [owner or operator] fails to satisfy a judgment or award based on a determination of liability for bodily injury or property damage to third parties caused by [“sudden” and/or “nonsudden”] accidental releases arising from the operation of the above-identified tank(s), or fails to pay an amount agreed to in settlement of a claim arising from or alleged to arise from such injury or damage, the guarantor, upon written instructions from the [Director], shall make funds available to compensate third parties for bodily injury and property damage in an amount not to exceed the coverage limits specified above.

(4) Guarantor agrees that if at the end of any fiscal year before cancellation of this guarantee, the guarantor fails to meet or exceed the requirements of the financial responsibility mechanism

specified in paragraph (1), guarantor shall send within 120 days of such failure, by certified mail, notice to [local government owner or operator], as evidenced by the return receipt.

(5) Guarantor agrees to notify [owner or operator] by certified mail of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code naming guarantor as debtor, within 10 days after commencement of the proceeding.

(6) Guarantor agrees to remain bound under this guarantee notwithstanding any modification or alteration of any obligation of [owner or operator] pursuant to 40 CFR part 280.

(7) Guarantor agrees to remain bound under this guarantee for so long as [local government owner or operator] must comply with the applicable financial responsibility requirements of 40 CFR part 280, subpart H for the above identified tank(s), except that guarantor may cancel this guarantee by sending notice by certified mail to [owner or operator], such cancellation to become effective no earlier than 120 days after receipt of such notice by [owner or operator], as evidenced by the return receipt. If notified of a probable release, the guarantor agrees to remain bound to the terms of this guarantee for all charges arising from the release, up to the coverage limits specified above, notwithstanding the cancellation of the guarantee with respect to future releases.

(8) The guarantor's obligation does not apply to any of the following:

(a) Any obligation of [local government owner or operator] under a workers' compensation disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert: local government owner or operator] arising from, and in the course of, employment by [insert: local government owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, loaded to, in the care, custody, or control of, or occupied by [insert: local government owner or operator] that is not the direct result of a release from a petroleum underground storage tank;

(e) Bodily damage or property damage for which [insert: owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR part 280.93.

(9) Guarantor expressly waives notice of acceptance of this guarantee by [the implementing agency], by any or all third parties, or by [local government owner or operator],

I hereby certify that the wording of this guarantee is identical to the wording specified in 40 CFR part 280.106(e) as such regulations were constituted on the effective date shown immediately below.

Effective date:____________________

[Name of guarantor]

[Authorized signature for guarantor]

[Name of person signing]

[Title of person signing]

Signature of witness or notary:

[58 FR 9056, Feb. 18, 1993]

§ 280.107 Local government fund.

A local government owner or operator may satisfy the requirements of §280.93 by establishing a dedicated fund account that conforms to the requirements of this section. Except as specified in paragraph (b), a dedicated fund may not be commingled with other funds or otherwise used in normal operations. A dedicated fund will be considered eligible if it meets one of the following requirements:

(a) The fund is dedicated by state constitutional provision, or local government statute, charter, ordinance, or order to pay for taking corrective action and for compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks and is funded for the full amount of coverage required under §280.93, or funded for part of the required amount of coverage and used in combination with other mechanism(s) that provide the remaining coverage; or

(b) The fund is dedicated by state constitutional provision, or local government statute, charter, ordinance, or order as a contingency fund for general emergencies, including taking corrective action and compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks, and is funded for five times the full amount of coverage required under §280.93, or funded for part of the required amount of coverage and used in combination with other mechanism(s) that provide the remaining coverage. If the fund is funded for less than five times the amount of coverage required under §280.93, the amount of financial responsibility demonstrated by the fund may not exceed one-fifth the amount in the fund; or

(c) The fund is dedicated by state constitutional provision, or local government statute, charter, ordinance or order to pay for taking corrective action and for compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks. A payment is made to the fund once every year for seven years until the fund is fully-funded. This seven year period is hereafter referred to as the “pay-in-period.” The amount of each payment must be determined by this formula:

$$\frac{TF - CF}{Y}$$

Where TF is the total required financial assurance for the owner or operator, CF is the current amount in the fund, and Y is the number of years remaining in the pay-in-period, and;

(1) The local government owner or operator has available bonding authority, approved through voter referendum (if such approval is necessary prior to the issuance of bonds), for an amount equal to the difference between the required amount of coverage and the amount held in the dedicated fund. This bonding authority shall be available for taking corrective action and for compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks, or

(2) The local government owner or operator has a letter signed by the appropriate state attorney general stating that the use of the bonding authority will not increase the local government's debt beyond the legal debt ceilings established by the relevant state laws. The letter must also state that prior voter approval is not necessary before use of the bonding authority.

(d) To demonstrate that it meets the requirements of the local government fund, the chief financial officer of the local government owner or operator and/or guarantor must sign a letter worded exactly as follows, except that the instructions in brackets are to be replaced by the relevant information and the brackets deleted:

Letter from Chief Financial Officer

I am the chief financial officer of [insert: name and address of local government owner or operator, or guarantor]. This letter is in support of the use of the local government fund mechanism to demonstrate financial responsibility for [insert: “taking corrective action” and/or “compensating third parties for bodily injury and property damage”] caused by [insert: “sudden accidental releases” and/or “nonsudden accidental releases”] in the amount of at least [insert: dollar amount] per occurrence and [insert: dollar amount] annual aggregate arising from operating (an) underground storage tank(s).

Underground storage tanks at the following facilities are assured by this local government fund mechanism: [List for each facility: the name and address of the facility where tanks are assured by the local government fund].

[Insert: “The local government fund is funded for the full amount of coverage required under §280.93, or funded for part of the required amount of coverage and used in combination with other mechanism(s) that provide the remaining coverage.” or “The local government fund is funded for ten times the full amount of coverage required under §280.93, or funded for part of the required amount of coverage and used in combination with other mechanisms(s) that provide the remaining coverage,” or “A payment is made to the fund once every year for seven years until the fund is fully-funded and [name of local government owner or operator] has available bonding authority, approved through voter referendum, of an amount equal to the difference between the required amount of coverage and the amount held in the dedicated fund” or “A payment is made to the fund once every year for seven years until the fund is fully-funded and I have attached a letter signed by the State Attorney General stating that (1) the use of the bonding authority will not increase the local government's debt beyond the legal debt ceilings established by the relevant state laws and (2) that prior voter approval is not necessary before use of the bonding authority"].

The details of the local government fund are as follows:

Amount in Fund (market value of fund at close of last fiscal year):____________________

[If fund balance is incrementally funded as specified in §280.107(c), insert:

Amount added to fund in the most recently completed fiscal year:____________________

Number of years remaining in the pay-in period: ____]

A copy of the state constitutional provision, or local government statute, charter, ordinance or order dedicating the fund is attached.

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR 280.107(d) as such regulations were constituted on the date shown immediately below.

[Date]

[Signature]

[Name]

[Title]

[58 FR 9059, Feb. 18, 1993]

§ 280.108 Substitution of financial assurance mechanisms by owner or operator.

(a) An owner or operator may substitute any alternate financial assurance mechanisms as specified in this subpart, provided that at all times he maintains an effective financial assurance mechanism or combination of mechanisms that satisfies the requirements of §280.93.

(b) After obtaining alternate financial assurance as specified in this subpart, an owner or operator may cancel a financial assurance mechanism by providing notice to the provider of financial assurance.

[53 FR 43370, Oct. 26, 1988. Redesignated at 58 FR 9051, Feb. 18, 1993]

§ 280.109 Cancellation or nonrenewal by a provider of financial assurance.

(a) Except as otherwise provided, a provider of financial assurance may cancel or fail to renew an assurance mechanism by sending a notice of termination by certified mail to the owner or operator.

(1) Termination of a local government guarantee, a guarantee, a surety bond, or a letter of credit may not occur until 120 days after the date on which the owner or operator receives the notice of termination, as evidenced by the return receipt.

(2) Termination of insurance or risk retention coverage, except for non-payment or misrepresentation by the insured, or state-funded assurance may not occur until 60 days after the date on which the owner or operator receives the notice of termination, as evidenced by the return receipt. Termination for non-payment of premium or misrepresentation by the insured may not occur until a minimum of 10 days after the date on which the owner or operator receives the notice of termination, as evidenced by the return receipt.

(b) If a provider of financial responsibility cancels or fails to renew for reasons other than incapacity of the provider as specified in §280.114, the owner or operator must obtain alternate coverage as specified in this section within 60 days after receipt of the notice of termination. If the owner or operator fails to obtain alternate coverage within 60 days after receipt of the notice of termination, the owner or operator must notify the Director of the implementing agency of such failure and submit:

(1) The name and address of the provider of financial assurance;

(2) The effective date of termination; and

(3) The evidence of the financial assistance mechanism subject to the termination maintained in accordance with §280.107(b).

[58 FR 9051, Feb. 18, 1993]

§ 280.110 Reporting by owner or operator.

(a) An owner or operator must submit the appropriate forms listed in §280.111(b) documenting current evidence of financial responsibility to the Director of the implementing agency:

(1) Within 30 days after the owner or operator identifies a release from an underground storage tank required to be reported under §280.53 or §280.61;

(2) If the owner or operator fails to obtain alternate coverage as required by this subpart, within 30 days after the owner or operator receives notice of:

(i) Commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming a provider of financial assurance as a debtor,

(ii) Suspension or revocation of the authority of a provider of financial assurance to issue a financial assurance mechanism,

(iii) Failure of a guarantor to meet the requirements of the financial test,

(iv) Other incapacity of a provider of financial assurance; or

(3) As required by §280.95(g) and §280.109(b).

(b) An owner or operator must certify compliance with the financial responsibility requirements of this part as specified in the new tank notification form when notifying the appropriate state or local agency of the installation of a new underground storage tank under §280.22.

(c) The Director of the Implementing Agency may require an owner or operator to submit evidence of financial assurance as described in §280.111(b) or other information relevant to compliance with this subpart at any time.

[58 FR 9051, Feb. 18, 1993]

§ 280.111 Recordkeeping.

(a) Owners or operators must maintain evidence of all financial assurance mechanisms used to demonstrate financial responsibility under this subpart for an underground storage tank until released from the requirements of this subpart under §208.113. An owner or operator must maintain such evidence at the underground storage tank site or the owner's or operator's place of work. Records maintained off-site must be made available upon request of the implementing agency.

(b) An owner or operator must maintain the following types of evidence of financial responsibility:

(1) An owner or operator using an assurance mechanism specified in §§280.95 through 280.100 or §280.102 or §§280.104 through 280.107 must maintain a copy of the instrument worded as specified.

(2) An owner or operator using a financial test or guarantee, or a local government financial test or a local government guarantee supported by the local

government financial test must maintain a copy of the chief financial officer's letter based on year-end financial statements for the most recent completed financial reporting year. Such evidence must be on file no later than 120 days after the close of the financial reporting year.

(3) An owner or operator using a guarantee, surety bond, or letter of credit must maintain a copy of the signed standby trust fund agreement and copies of any amendments to the agreement.

(4) A local government owner or operator using a local government guarantee under §280.106(d) must maintain a copy of the signed standby trust fund agreement and copies of any amendments to the agreement.

(5) A local government owner or operator using the local government bond rating test under §280.104 must maintain a copy of its bond rating published within the last twelve months by Moody's or Standard & Poor's.

(6) A local government owner or operator using the local government guarantee under §280.106, where the guarantor's demonstration of financial responsibility relies on the bond rating test under §280.104 must maintain a copy of the guarantor's bond rating published within the last twelve months by Moody's or Standard & Poor's.

(7) An owner or operator using an insurance policy or risk retention group coverage must maintain a copy of the signed insurance policy or risk retention group coverage policy, with the endorsement or certificate of insurance and any amendments to the agreements.

(8) An owner or operator covered by a state fund or other state assurance must maintain on file a copy of any evidence of coverage supplied by or required by the state under §280.101(d).

(9) An owner or operator using a local government fund under §280.107 must maintain the following documents:

(i) A copy of the state constitutional provision or local government statute, charter, ordinance, or order dedicating the fund, and

(ii) Year-end financial statements for the most recent completed financial reporting year showing the amount in the fund. If the fund is established under §280.107(a)(3) using incremental funding backed by bonding authority, the financial statements must show the previous year's balance, the amount of funding during the year, and the closing balance in the fund.

(iii) If the fund is established under §280.107(a)(3) using incremental funding backed by bonding authority, the owner or operator must also maintain documentation of the required bonding authority, including either the results of a voter referendum (under §280.107(a)(3)(i)), or attestation by the State Attorney General as specified under §280.107(a)(3)(ii).

(10) A local government owner or operator using the local government guarantee supported by the local government fund must maintain a copy of the guarantor's year-end financial statements for the most recent completed financial reporting year showing the amount of the fund.

(11)(i) An owner or operator using an assurance mechanism specified in §§280.95 through 280.107 must maintain an updated copy of a certification of financial responsibility worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

Certification of Financial Responsibility

[Owner or operator] hereby certifies that it is in compliance with the requirements of subpart H of 40 CFR part 280.

The financial assurance mechanism(s) used to demonstrate financial responsibility under subpart H of 40 CFR part 280 is (are) as follows:

[For each mechanism, list the type of mechanism, name of issuer, mechanism number (if applicable), amount of coverage, effective period of coverage and whether the mechanism covers “taking corrective action” and/or “compensating third parties for bodily injury and property damage caused by” either “sudden accidental releases” or “nonsudden accidental releases” or “accidental releases.”]

[Signature of owner or operator]

[Name of owner or operator]

[Title]

[Date]

[Signature of witness or notary]

[Name of witness or notary]

[Date]

(ii) The owner or operator must update this certification whenever the financial assurance mechanism(s) used to demonstrate financial responsibility change(s).

[58 FR 9051, Feb. 18, 1993]

§ 280.112 Drawing on financial assurance mechanisms.

(a) Except as specified in paragraph (d) of this section, the Director of the implementing agency shall require the guarantor, surety, or institution issuing a letter of credit to place the amount of funds stipulated by the Director, up to the limit of funds provided by the financial assurance mechanism, into the standby trust if:

(1)(i) The owner or operator fails to establish alternate financial assurance within 60 days after receiving notice of cancellation of the guarantee, surety bond, letter of credit, or, as applicable, other financial assurance mechanism; and

(ii) The Director determines or suspects that a release from an underground storage tank covered by the mechanism has occurred and so notifies the owner or operator or the owner or operator has notified the Director pursuant to subparts E or F of a release from an underground storage tank covered by the mechanism; or

(2) The conditions of paragraph (b)(1) or (b)(2) (i) or (ii) of this section are satisfied.

(b) The Director of the implementing agency may draw on a standby trust fund when:

(1) The Director makes a final determination that a release has occurred and immediate or long-term corrective action for the release is needed, and the owner or operator, after appropriate notice and opportunity to comply, has not conducted corrective action as required under 40 CFR part 280, subpart F; or

(2) The Director has received either:

(i) Certification from the owner or operator and the third-party liability claimant(s) and from attorneys representing the owner or operator and the third-party liability claimant(s) that a third-party liability claim should be paid. The certification must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

Certification of Valid Claim

The undersigned, as principals and as legal representatives of [insert: owner or operator] and [insert: name and address of third-party claimant], hereby certify that the claim of bodily injury [and/or] property damage caused by an accidental release arising from operating [owner's or operator's] underground storage tank should be paid in the amount of $[______].

[Signatures]

Owner or Operator

Attorney for Owner or Operator

(Notary)

Date

[Signatures]

Claimant(s)

Attorney(s) for Claimant(s)

(Notary)

Date

or (ii) A valid final court order establishing a judgment against the owner or operator for bodily injury or property damage caused by an accidental release from an underground storage tank covered by financial assurance under this subpart and the Director determines that the owner or operator has not satisfied the judgment.

(c) If the Director of the implementing agency determines that the amount of corrective action costs and third-party liability claims eligible for payment under paragraph (b) of this section may exceed the balance of the standby trust fund and the obligation of the provider of financial assurance, the first priority for payment shall be corrective action costs necessary to protect human health and the environment. The Director shall pay third-party liability claims in the order in which the Director receives certifications under paragraph (b)(2)(i) of this section, and valid court orders under paragraph (b)(2)(ii) of this section.

(d) A governmental entity acting as guarantor under §280.106(e), the local government guarantee without standby trust, shall make payments as directed by the Director under the circumstances described in §280.112 (a), (b), and (c).

[58 FR 9052, Feb. 18, 1993]

§ 280.113   Release from the requirements.

An owner or operator is no longer required to maintain financial responsibility under this subpart for an underground storage tank after the tank has been properly closed or, if corrective action is required, after corrective action has been completed and the tank has been properly closed as required by 40 CFR part 280, subpart G.

[53 FR 43370, Oct. 26, 1988. Redesignated at 58 FR 9051, Feb. 18, 1993]

§ 280.114 Bankruptcy or other incapacity of owner or operator or provider of financial assurance.

(a) Within 10 days after commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming an owner or operator as debtor, the owner or operator must notify the Director of the implementing agency by certified mail of such commencement and submit the appropriate forms listed in §280.111(b) documenting current financial responsibility.

(b) Within 10 days after commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming a guarantor providing financial assurance as debtor, such guarantor must notify the owner or operator by certified mail of such commencement as required under the terms of the guarantee specified in §280.96.

(c) Within 10 days after commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming a local government owner or operator as debtor, the local government owner or operator must notify the Director of the implementing agency by certified mail of such commencement and submit the appropriate forms listed in §280.111(b) documenting current financial responsibility.

(d) Within 10 days after commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming a guarantor providing a local government financial assurance as debtor, such guarantor must notify the local government owner or operator by certified mail of such commencement as required under the terms of the guarantee specified in §280.106.

(e) An owner or operator who obtains financial assurance by a mechanism other than the financial test of self-insurance will be deemed to be without the required financial assurance in the event of a bankruptcy or incapacity of its provider of financial assurance, or a suspension or revocation of the authority of the provider of financial assurance to issue a guarantee, insurance policy, risk retention group coverage policy, surety bond, letter of credit, or state-required mechanism. The owner or operator must obtain alternate financial assurance as specified in this subpart within 30 days after receiving notice of such an event. If the owner or operator does not obtain alternate coverage within 30 days after such notification, he must notify the Director of the implementing agency.

(f) Within 30 days after receipt of notification that a state fund or other state assurance has become incapable of paying for assured corrective action or third-party compensation costs, the owner or operator must obtain alternate financial assurance.

[58 FR 9053, Feb. 18, 1993]

§ 280.115 Replenishment of guarantees, letters of credit, or surety bonds.

(a) If at any time after a standby trust is funded upon the instruction of the Director of the implementing agency with funds drawn from a guarantee, local government guarantee with standby trust, letter of credit, or surety bond, and the amount in the standby trust is reduced below the full amount of coverage required, the owner or operator shall by the anniversary date of the financial mechanism from which the funds were drawn:

(1) Replenish the value of financial assurance to equal the full amount of coverage required, or

(2) Acquire another financial assurance mechanism for the amount by which funds in the standby trust have been reduced.

(b) For purposes of this section, the full amount of coverage required is the amount of coverage to be provided by §280.93 of this subpart. If a combination of mechanisms was used to provide the assurance funds which were drawn upon, replenishment shall occur by the earliest anniversary date among the mechanisms.

[58 FR 9053, Feb. 18, 1993]

§ 280.116 Suspension of enforcement. [Reserved]

Subpart I—Lender Liability

Source: 60 FR 46711, Sept. 7, 1995, unless otherwise noted.

§ 280.200 Definitions.

(a) *UST technical standards,* as used in this subpart, refers to the UST preventative and operating requirements under 40 CFR part 280, subparts B, C, D, G, and §280.50 of subpart E.

(b) *Petroleum production, refining, and marketing.* (1) *Petroleum production* means the production of crude oil or other forms of petroleum (as defined in §280.12) as well as the production of petroleum products from purchased materials.

(2) *Petroleum refining* means the cracking, distillation, separation, conversion, upgrading, and finishing of refined petroleum or petroleum products.

(3) *Petroleum marketing* means the distribution, transfer, or sale of petroleum or petroleum products for wholesale or retail purposes.

(c) *Indicia of ownership* means evidence of a secured interest, evidence of an interest in a security interest, or evidence of an interest in real or personal property securing a loan or other obligation, including any legal or equitable title or deed to real or personal property acquired through or incident to foreclosure. Evidence of such interests include, but are not limited to, mortgages, deeds of trust, liens, surety bonds and guarantees of obligations, title held pursuant to a lease financing transaction in which the lessor does not select initially the leased property (hereinafter “lease financing transaction”), and legal or equitable title obtained pursuant to foreclosure. Evidence of such interests also includes assignments, pledges, or other rights to or other forms of encumbrance against property that are held primarily to protect a security interest. A person is not required to hold title or a security interest in order to maintain indicia of ownership.

(d) *A holder* is a person who, upon the effective date of this regulation or in the future, maintains indicia of ownership (as defined in §280.200(c)) primarily to protect a security interest (as defined in §280.200(f)(1)) in a petroleum UST or UST system or facility or property on which a petroleum UST or UST system is located. A holder includes the initial holder (such as a loan originator); any subsequent holder (such as a successor-in-interest or subsequent purchaser of the security interest on the secondary market); a guarantor of an obligation, surety, or any other person who holds ownership indicia primarily to protect a security interest; or a receiver or other person who acts on behalf or for the benefit of a holder.

(e) *A borrower, debtor, or obligor* is a person whose UST or UST system or facility or property on which the UST or UST system is located is encumbered by a security interest. These terms may be used interchangeably.

(f) *Primarily to protect a security interest* means that the holder's indicia of ownership are held primarily for the purpose of securing payment or performance of an obligation.

(1) *Security interest* means an interest in a petroleum UST or UST system or in the facility or property on which a petroleum UST or UST system is located, created or established for the purpose of securing a loan or other obligation. Security interests include but are not limited to mortgages, deeds of trusts, liens, and title pursuant to lease financing transactions. Security interests may also arise from transactions such as sale and leasebacks, conditional sales, installment sales, trust receipt transactions, certain assignments, factoring agreements, accounts receivable financing arrangements, and consignments, if the transaction creates or establishes an interest in an UST or UST system or in the facility or property on which the UST or UST system is located, for the purpose of securing a loan or other obligation.

(2) *Primarily to protect a security interest,* as used in this subpart, does not include indicia of ownership held primarily for investment purposes, nor ownership indicia held primarily for purposes other than as protection for a security interest. A holder may have other, secondary reasons for maintaining indicia of ownership, but the primary reason why any ownership indicia are held must be as protection for a security interest.

(g) *Operation* means, for purposes of this subpart, the use, storage, filling, or dispensing of petroleum contained in an UST or UST system.

§ 280.210 Participation in management.

The term “participating in the management of an UST or UST system” means that, subsequent to the effective date of this subpart, December 6, 1995, the holder is engaging in decisionmaking control of, or activities related to, operation of the UST or UST system, as defined herein.

(a) Actions that are participation in management.

(1) Participation in the management of an UST or UST system means, for purposes of this subpart, actual participation by the holder in the management or control of decisionmaking related to the operation of an UST or UST system. Participation in management does not include the mere capacity or ability to influence or the unexercised right to control UST or UST system operations. A

holder is participating in the management of the UST or UST system only if the holder either:

(i) Exercises decisionmaking control over the operational (as opposed to financial or administrative) aspects of the UST or UST system, such that the holder has undertaken responsibility for all or substantially all of the management of the UST or UST system; or

(ii) Exercises control at a level comparable to that of a manager of the borrower's enterprise, such that the holder has assumed or manifested responsibility for the overall management of the enterprise encompassing the day-to-day decisionmaking of the enterprise with respect to all, or substantially all, of the operational (as opposed to financial or administrative) aspects of the enterprise.

(2) Operational aspects of the enterprise relate to the use, storage, filling, or dispensing of petroleum contained in an UST or UST system, and include functions such as that of a facility or plant manager, operations manager, chief operating officer, or chief executive officer. Financial or administrative aspects include functions such as that of a credit manager, accounts payable/receivable manager, personnel manager, controller, chief financial officer, or similar functions. Operational aspects of the enterprise do not include the financial or administrative aspects of the enterprise, or actions associated with environmental compliance, or actions undertaken voluntarily to protect the environment in accordance with applicable requirements in 40 CFR part 280 or applicable state requirements in those states that have been delegated authority by EPA to administer the UST program pursuant to 42 USC 6991c and 40 CFR part 281.

(b) Actions that are not participation in management pre-foreclosure.

(1) Actions at the inception of the loan or other transaction. No act or omission prior to the time that indicia of ownership are held primarily to protect a security interest constitutes evidence of participation in management within the meaning of this subpart. A prospective holder who undertakes or requires an environmental investigation (which could include a site assessment, inspection, and/or audit) of the UST or UST system or facility or property on which the UST or UST system is located (in which indicia of ownership are to be held), or requires a prospective borrower to clean up contamination from the UST or UST system or to comply or come into compliance (whether prior or subsequent to the time that indicia of ownership are held primarily to protect a security interest) with any applicable law or regulation, is not by such action considered to be participating in the management of the UST or UST system or facility or property on which the UST or UST system is located.

(2) Loan policing and work out. Actions that are consistent with holding ownership indicia primarily to protect a security interest do not constitute participation in management for purposes of this subpart. The authority for the

holder to take such actions may, but need not, be contained in contractual or other documents specifying requirements for financial, environmental, and other warranties, covenants, conditions, representations or promises from the borrower. Loan policing and work out activities cover and include all such activities up to foreclosure, exclusive of any activities that constitute participation in management.

(i) Policing the security interest or loan.

(A) A holder who engages in policing activities prior to foreclosure will remain within the exemption provided that the holder does not together with other actions participate in the management of the UST or UST system as provided in §280.210(a). Such policing actions include, but are not limited to, requiring the borrower to clean up contamination from the UST or UST system during the term of the security interest; requiring the borrower to comply or come into compliance with applicable federal, state, and local environmental and other laws, rules, and regulations during the term of the security interest; securing or exercising authority to monitor or inspect the UST or UST system or facility or property on which the UST or UST system is located (including on-site inspections) in which indicia of ownership are maintained, or the borrower's business or financial condition during the term of the security interest; or taking other actions to adequately police the loan or security interest (such as requiring a borrower to comply with any warranties, covenants, conditions, representations, or promises from the borrower).

(B) Policing activities also include undertaking by the holder of UST environmental compliance actions and voluntary environmental actions taken in compliance with 40 CFR part 280, provided that the holder does not otherwise participate in the management or daily operation of the UST or UST system as provided in §280.210(a) and §280.230. Such allowable actions include, but are not limited to, release detection and release reporting, release response and corrective action, temporary or permanent closure of an UST or UST system, UST upgrading or replacement, and maintenance of corrosion protection. A holder who undertakes these actions must do so in compliance with the applicable requirements in 40 CFR part 280 or applicable state requirements in those states that have been delegated authority by EPA to administer the UST program pursuant to 42 U.S.C. 6991c and 40 CFR part 281. A holder may directly oversee these environmental compliance actions and voluntary environmental actions, and directly hire contractors to perform the work, and is not by such action considered to be participating in the management of the UST or UST system.

(ii) Loan work out. A holder who engages in work out activities prior to foreclosure will remain within the exemption provided that the holder does not together with other actions participate in the management of the UST or UST system as provided in §280.210(a). For purposes of this rule, “work out” refers to those actions by which a holder, at any time prior to foreclosure, seeks to prevent, cure, or mitigate a default by the borrower or obligor; or to preserve, or prevent the diminution of, the value of the security. Work out activities include, but are not limited to, restructuring or renegotiating the terms of the security interest; requiring payment of additional rent or interest; exercising forbearance; requiring or exercising rights pursuant to an assignment of accounts or other amounts owing to an obligor; requiring or exercising rights pursuant to an escrow agreement pertaining to amounts owing to an obligor; providing specific or general financial or other advice, suggestions, counseling, or guidance; and exercising any right or remedy the holder is entitled to by law or under any warranties, covenants, conditions, representations, or promises from the borrower.

(c) Foreclosure on an UST or UST system or facility or property on which an UST or UST system is located, and participation in management activities post-foreclosure.

(1) Foreclosure. (i) Indicia of ownership that are held primarily to protect a security interest include legal or equitable title or deed to real or personal property acquired through or incident to foreclosure. For purposes of this subpart, the term “foreclosure” means that legal, marketable or equitable title or deed has been issued, approved, and recorded, and that the holder has obtained access to the UST, UST system, UST facility, and property on which the UST or UST system is located, provided that the holder acted diligently to acquire marketable title or deed and to gain access to the UST, UST system, UST facility, and property on which the UST or UST system is located. The indicia of ownership held after foreclosure continue to be maintained primarily as protection for a security interest provided that the holder undertakes to sell, re-lease an UST or UST system or facility or property on which the UST or UST system is located, held pursuant to a lease financing transaction (whether by a new lease financing transaction or substitution of the lessee), or otherwise divest itself of the UST or UST system or facility or property on which the UST or UST system is located, in a reasonably expeditious manner, using whatever commercially reasonable means are relevant or appropriate with respect to the UST or UST system or facility or property on which the UST or UST system is located, taking all facts and circumstances into consideration, and provided that the holder does not participate in management (as defined in §280.210(a)) prior to or after foreclosure.

(ii) For purposes of establishing that a holder is seeking to sell, re-lease pursuant to a lease financing transaction (whether by a new lease financing transaction or substitution of the lessee), or divest in a reasonably expeditious manner an UST or UST system or facility or property on which the UST or UST system is located, the holder may use whatever commercially reasonable means as are relevant or appropriate with respect to the UST or UST system or facility or property on which the UST or UST system is located, or may employ the means specified in

§280.210(c)(2). A holder that outbids, rejects, or fails to act upon a written *bona fide,* firm offer of fair consideration for the UST or UST system or facility or property on which the UST or UST system is located, as provided in §280.210(c)(2), is not considered to hold indicia of ownership primarily to protect a security interest.

(2) Holding foreclosed property for disposition and liquidation. A holder, who does not participate in management prior to or after foreclosure, may sell, re-lease, pursuant to a lease financing transaction (whether by a new lease financing transaction or substitution of the lessee), an UST or UST system or facility or property on which the UST or UST system is located, liquidate, wind up operations, and take measures, prior to sale or other disposition, to preserve, protect, or prepare the secured UST or UST system or facility or property on which the UST or UST system is located. A holder may also arrange for an existing or new operator to continue or initiate operation of the UST or UST system. The holder may conduct these activities without voiding the security interest exemption, subject to the requirements of this subpart.

(i) A holder establishes that the ownership indicia maintained after foreclosure continue to be held primarily to protect a security interest by, within 12 months following foreclosure, listing the UST or UST system or the facility or property on which the UST or UST system is located, with a broker, dealer, or agent who deals with the type of property in question, or by advertising the UST or UST system or facility or property on which the UST or UST system is located, as being for sale or disposition on at least a monthly basis in either a real estate publication or a trade or other publication suitable for the UST or UST system or facility or property on which the UST or UST system is located, or a newspaper of general circulation (defined as one with a circulation over 10,000, or one suitable under any applicable federal, state, or local rules of court for publication required by court order or rules of civil procedure) covering the location of the UST or UST system or facility or property on which the UST or UST system is located. For purposes of this provision, the 12-month period begins to run from December 6, 1995 or from the date that the marketable title or deed has been issued, approved and recorded, and the holder has obtained access to the UST, UST system, UST facility and property on which the UST or UST system is located, whichever is later, provided that the holder acted diligently to acquire marketable title or deed and to obtain access to the UST, UST system, UST facility and property on which the UST or UST system is located. If the holder fails to act diligently to acquire marketable title or deed or to gain access to the UST or UST system, the 12-month period begins to run from December 6, 1995 or from the date on which the holder first acquires either title to or possession of the secured UST or UST system, or facility or property on which the UST or UST system is located, whichever is later.

(ii) A holder that outbids, rejects, or fails to act upon an offer of fair consideration for the UST or UST system or the facility or property on which the UST or UST system is located, establishes by such outbidding, rejection, or failure to act, that the ownership indicia in the secured UST or UST system or facility or property on which the UST or UST system is located are not held primarily to protect the security interest, unless the holder is required, in order to avoid liability under federal or state law, to make a higher bid, to obtain a higher offer, or to seek or obtain an offer in a different manner.

(A) Fair consideration, in the case of a holder maintaining indicia of ownership primarily to protect a senior security interest in the UST or UST system or facility or property on which the UST or UST system is located, is the value of the security interest as defined in this section. The value of the security interest includes all debt and costs incurred by the security interest holder, and is calculated as an amount equal to or in excess of the sum of the outstanding principal (or comparable amount in the case of a lease that constitutes a security interest) owed to the holder immediately preceding the acquisition of full title (or possession in the case of a lease financing transaction) pursuant to foreclosure, plus any unpaid interest, rent, or penalties (whether arising before or after foreclosure). The value of the security interest also includes all reasonable and necessary costs, fees, or other charges incurred by the holder incident to work out, foreclosure, retention, preserving, protecting, and preparing, prior to sale, the UST or UST system or facility or property on which the UST or UST system is located, re-lease, pursuant to a lease financing transaction (whether by a new lease financing transaction or substitution of the lessee), of an UST or UST system or facility or property on which the UST or UST system is located, or other disposition. The value of the security interest also includes environmental investigation costs (which could include a site assessment, inspection, and/or audit of the UST or UST system or facility or property on which the UST or UST system is located), and corrective action costs incurred under §§280.51 through 280.67 or any other costs incurred as a result of reasonable efforts to comply with any other applicable federal, state or local law or regulation; less any amounts received by the holder in connection with any partial disposition of the property and any amounts paid by the borrower (if not already applied to the borrower's obligations) subsequent to the acquisition of full title (or possession in the case of a lease financing transaction) pursuant to foreclosure. In the case of a holder maintaining indicia of ownership primarily to protect a junior security interest, fair consideration is the value of all outstanding higher priority security interests plus the value of the security interest held by the junior holder, each calculated as set forth in this paragraph.

(B) Outbids, rejects, or fails to act upon an offer of fair consideration means that the holder outbids, rejects, or fails to act upon within 90 days of receipt, a written, *bona fide,* firm offer of fair consideration for the UST or UST system or facility or property on which the UST or UST system is located received at any time after six months following foreclosure, as defined in §280.210(c). A “written, *bona fide,* firm offer” means a legally enforceable, commercially reasonable, cash offer solely for the foreclosed UST or UST system or facility or property on which the

UST or UST system is located, including all material terms of the transaction, from a ready, willing, and able purchaser who demonstrates to the holder's satisfaction the ability to perform. For purposes of this provision, the six-month period begins to run from December 6, 1995 or from the date that marketable title or deed has been issued, approved and recorded to the holder, and the holder has obtained access to the UST, UST system, UST facility and property on which the UST or UST system is located, whichever is later, provided that the holder was acting diligently to acquire marketable title or deed and to obtain access to the UST or UST system, UST facility and property on which the UST or UST system is located. If the holder fails to act diligently to acquire marketable title or deed or to gain access to the UST or UST system, the six-month period begins to run from December 6, 1995 or from the date on which the holder first acquires either title to or possession of the secured UST or UST system, or facility or property on which the UST or UST system is located, whichever is later.

(3) Actions that are not participation in management post-foreclosure. A holder is not considered to be participating in the management of an UST or UST system or facility or property on which the UST or UST system is located when undertaking actions under 40 CFR part 280, provided that the holder does not otherwise participate in the management or daily operation of the UST or UST system as provided in §280.210(a) and §280.230. Such allowable actions include, but are not limited to, release detection and release reporting, release response and corrective action, temporary or permanent closure of an UST or UST system, UST upgrading or replacement, and maintenance of corrosion protection. A holder who undertakes these actions must do so in compliance with the applicable requirements in 40 CFR part 280 or applicable state requirements in those states that have been delegated authority by EPA to administer the UST program pursuant to 42 U.S.C. 6991c and 40 CFR part 281. A holder may directly oversee these environmental compliance actions and voluntary environmental actions, and directly hire contractors to perform the work, and is not by such action considered to be participating in the management of the UST or UST system.

§ 280.220 Ownership of an underground storage tank or underground storage tank system or facility or property on which an underground storage tank or underground storage tank system is located.

Ownership of an UST or UST system or facility or property on which an UST or UST system is located. A holder is not an “owner” of a petroleum UST or UST system or facility or property on which a petroleum UST or UST system is located for purposes of compliance with the UST technical standards as defined in §280.200(a), the UST corrective action requirements under §§280.51 through 280.67, and the UST financial responsibility requirements under §§280.90 through 280.111, provided the person:

(a) Does not participate in the management of the UST or UST system as defined in §280.210; and

(b) Does not engage in petroleum production, refining, and marketing as defined in §280.200(b).

§ 280.230 Operating an underground storage tank or underground storage tank system.

(a) Operating an UST or UST system prior to foreclosure. A holder, prior to foreclosure, as defined in §280.210(c), is not an “operator” of a petroleum UST or UST system for purposes of compliance with the UST technical standards as defined in §280.200(a), the UST corrective action requirements under §§280.51 through 280.67, and the UST financial responsibility requirements under §§280.90 through 280.111, provided that, after December 6, 1995, the holder is not in control of or does not have responsibility for the daily operation of the UST or UST system.

(b) Operating an UST or UST system after foreclosure. The following provisions apply to a holder who, through foreclosure, as defined in §280.210(c), acquires a petroleum UST or UST system or facility or property on which a petroleum UST or UST system is located.

(1) A holder is not an “operator” of a petroleum UST or UST system for purposes of compliance with 40 CFR part 280 if there is an operator, other than the holder, who is in control of or has responsibility for the daily operation of the UST or UST system, and who can be held responsible for compliance with applicable requirements of 40 CFR part 280 or applicable state requirements in those states that have been delegated authority by EPA to administer the UST program pursuant to 42 U.S.C. 6991c and 40 CFR part 281.

(2) If another operator does not exist, as provided for under paragraph (b)(1) of this section, a holder is not an “operator” of the UST or UST system, for purposes of compliance with the UST technical standards as defined in §280.200(a), the UST corrective action requirements under §§280.51 through 280.67, and the UST financial responsibility requirements under §§280.90 through 280.111, provided that the holder:

(i) Empties all of its known USTs and UST systems within 60 calendar days after foreclosure or within 60 calendar days after December 6, 1995, whichever is later, or another reasonable time period specified by the implementing agency, so that no more than 2.5 centimeters (one inch) of residue, or 0.3 percent by weight of the total capacity of the UST system, remains in the system; leaves vent lines open and functioning; and caps and secures all other lines, pumps, manways, and ancillary equipment; and

(ii) Empties those USTs and UST systems that are discovered after foreclosure within 60 calendar days after discovery or within 60 calendar days after December 6, 1995, whichever is later, or another reasonable time period specified by the implementing agency, so that no more than 2.5 centimeters (one inch) of residue, or 0.3 percent by weight of the total capacity of the UST system, remains in the system; leaves vent lines open and functioning; and caps and secures all other lines, pumps, manways, and ancillary equipment.

(3) If another operator does not exist, as provided for under paragraph (b)(1) of this section, in addition to satisfying the conditions under paragraph (b)(2) of this section, the holder must either:

(i) Permanently close the UST or UST system in accordance with §§280.71 through 280.74, except §280.72(b); or

(ii) Temporarily close the UST or UST system in accordance with the following applicable provisions of §280.70:

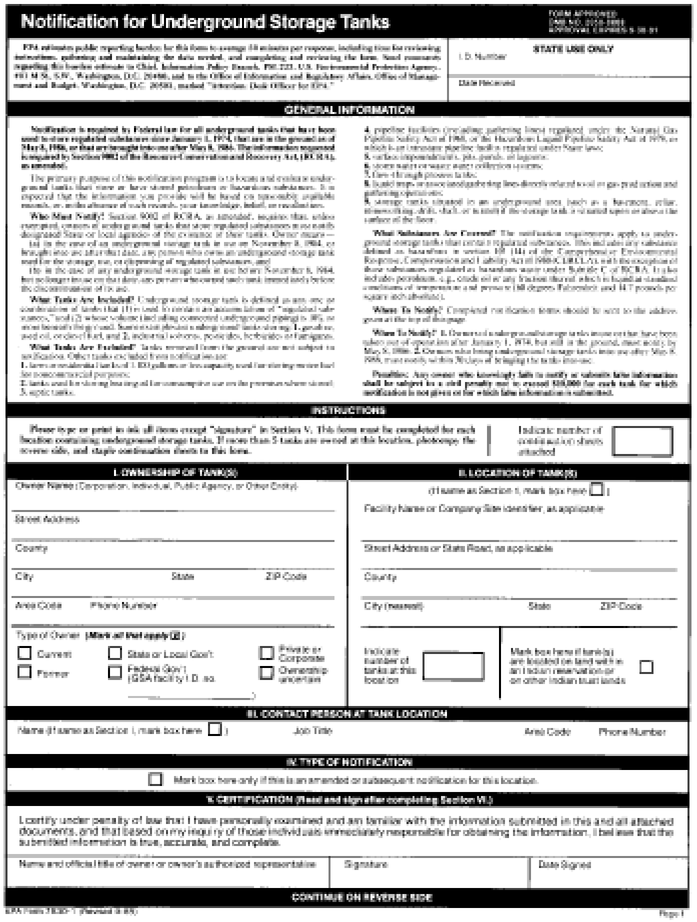
(A) Continue operation and maintenance of corrosion protection in accordance with §280.31;

(B) Report suspected releases to the implementing agency; and

(C) Conduct a site assessment in accordance with §280.72(a) if the UST system is temporarily closed for more than 12 months and the UST system does not meet either the performance standards in §280.20 for new UST systems or the upgrading requirements in §280.21, except that the spill and overfill equipment requirements do not have to be met. The holder must report any suspected releases to the implementing agency. For purposes of this provision, the 12-month period begins to run from December 6, 1995 or from the date on which the UST system is emptied and secured under paragraph (b)(2) of this section, whichever is later.

(4) The UST system can remain in temporary closure until a subsequent purchaser has acquired marketable title to the UST or UST system or facility or property on which the UST or UST system is located. Once a subsequent purchaser acquires marketable title to the UST or UST system or facility or property on which the UST or UST system is located, the purchaser must decide whether to operate or close the UST or UST system in accordance with applicable requirements in 40 CFR part 280 or applicable state requirements in those states that have been delegated authority by EPA to administer the UST program pursuant to 42 U.S.C. 6991c and 40 CFR part 281.

Appendix I to Part 280—Notification for Underground Storage Tanks (Form)



Notification for Underground Storage Tanks

FORM APPROVED [illegible]

[illegible]

STATE USE ONLY

I.D. Number

Date Received

GENERAL INFORMATION

[illegible]

INSTRUCTIONS

Please type or print in ink all items except "signature" in Section V. This form must be completed for each location containing underground storage tanks. If more than 5 tanks are owned at this location, photocopy the reverse side, and staple continuation sheets to this form.

Indicate number of continuation sheets attached

I. OWNERSHIP OF TANK(S)

Owner Name (Corporation, Individual, Public Agency, or Other Entity)

Street Address

County

City | State | ZIP Code

Area Code | Phone Number

Type of Owner (Mark all that apply ☒)

☐ Current ☐ State or Local Gov't ☐ Private or Corporate

☐ Former ☐ Federal Gov't (GSA facility I.D. no.) ☐ Ownership uncertain

II. LOCATION OF TANK(S)

(If same as Section I, mark box here ☐)

Facility Name or Company Site Identifier, as applicable

Street Address or State Road, as applicable

County

City (nearest) | State | ZIP Code

Indicate number of tanks at this location

Mark box here if tank(s) are located on land within an Indian reservation or on other Indian trust lands ☐

III. CONTACT PERSON AT TANK LOCATION

Name (If same as Section I, mark box here ☐) | Job Title | Area Code | Phone Number

IV. TYPE OF NOTIFICATION

☐ Mark box here only if this is an amended or subsequent notification for this location.

V. CERTIFICATION (Read and sign after completing Section VI.)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Name and official title of owner or owner's authorized representative | Signature | Date Signed

CONTINUE ON REVERSE SIDE

EPA Form 7530-1 (Revised 8-85) | Page 1

[View or download PDF]

Owner Name (from Section I) ____________ Location (from Section II) ____________ Page No. ____ of ____ Pages

VI. DESCRIPTION OF UNDERGROUND STORAGE TANKS (Complete for each tank at this location.)

Tank Identification No. (e.g., ABC-123), or Arbitrarily Assigned Sequential Number (e.g., 1,2,3...)	Tank No.	Tank No.	Tank No.	Tank No.	Tank No.
1. Status of Tank *(Mark all that apply ☒)* Currently in Use	☐	☐	☐	☐	☐
Temporarily Out of Use	☐	☐	☐	☐	☐
Permanently Out of Use	☐	☐	☐	☐	☐
Brought into Use after 5/8/86	☐	☐	☐	☐	☐
2. Estimated Age (Years)					
3. Estimated Total Capacity (Gallons)					
4. Material of Construction *(Mark one ☒)* Steel	☐	☐	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Fiberglass Reinforced Plastic	☐	☐	☐	☐	☐
Unknown	☐	☐	☐	☐	☐
Other, Please Specify	____	____	____	____	____
5. Internal Protection *(Mark all that apply ☒)* Cathodic Protection	☐	☐	☐	☐	☐
Interior Lining (e.g., epoxy resins)	☐	☐	☐	☐	☐
None	☐	☐	☐	☐	☐
Unknown	☐	☐	☐	☐	☐
Other, Please Specify	____	____	____	____	____
6. External Protection *(Mark all that apply ☒)* Cathodic Protection	☐	☐	☐	☐	☐
Painted (e.g., asphaltic)	☐	☐	☐	☐	☐
Fiberglass Reinforced Plastic Coated	☐	☐	☐	☐	☐
None	☐	☐	☐	☐	☐
Unknown	☐	☐	☐	☐	☐
Other, Please Specify	____	____	____	____	____
7. Piping *(Mark all that apply ☒)* Bare Steel	☐	☐	☐	☐	☐
Galvanized Steel	☐	☐	☐	☐	☐
Fiberglass Reinforced Plastic	☐	☐	☐	☐	☐
Cathodically Protected	☐	☐	☐	☐	☐
Unknown	☐	☐	☐	☐	☐
Other, Please Specify	____	____	____	____	____
8. Substance Currently or Last Stored in Greatest Quantity by Volume *(Mark all that apply ☒)* **a. Empty**	☐	☐	☐	☐	☐
b. Petroleum					
Diesel	☐	☐	☐	☐	☐
Kerosene	☐	☐	☐	☐	☐
Gasoline (including alcohol blends)	☐	☐	☐	☐	☐
Used Oil	☐	☐	☐	☐	☐
Other, Please Specify	____	____	____	____	____
c. Hazardous Substance	☐	☐	☐	☐	☐
Please Indicate Name of Principal CERCLA Substance	____	____	____	____	____
OR Chemical Abstract Service (CAS) No.	____	____	____	____	____
Mark box ☒ if tank stores a mixture of substances	☐	☐	☐	☐	☐
d. Unknown	☐	☐	☐	☐	☐
9. Additional Information (for tanks permanently taken out of service)					
a. Estimated date last used (mo/yr)	/	/	/	/	/
b. Estimated quantity of substance remaining (gal.)	____	____	____	____	____
c. Mark box ☒ if tank was filled with inert material (e.g., sand, concrete)	☐	☐	☐	☐	☐

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Owner Name (from Section I) ______ Location (from Section II) ______ Page No. ____ of ____ Pages

VII. CERTIFICATION OF COMPLIANCE (COMPLETE FOR ALL NEW TANKS AT THIS LOCATION)

10. Installation (mark all that apply):

- ☐ The installer has been certified by the tank and piping manufacturers.
- ☐ The installer has been certified or licensed by the implementing agency.
- ☐ The installation has been inspected and certified by a registered professional engineer.
- ☐ The installation has been inspected and approved by the implementing agency.
- ☐ All work listed on the manufacturer's installation checklists has been completed.
- ☐ Another method was used as allowed by the implementing agency. Please specify.

______

11. Release Detection (mark all that apply):

- ☐ Manual tank gauging.
- ☐ Tank tightness testing with inventory controls.
- ☐ Automatic tank gauging.
- ☐ Vapor monitoring.
- ☐ Ground-water monitoring.
- ☐ Interstitial monitoring within a secondary barrier.
- ☐ Interstitial monitoring within secondary containment.
- ☐ Automatic line leak detectors.
- ☐ Line tightness testing.
- ☐ Another method allowed by the implementing agency. Please specify.

______

12. Corrosion Protection (if applicable)

- ☐ As specified for coated steel tanks with cathodic protection.
- ☐ As specified for coated steel piping with cathodic protection.
- ☐ Another method allowed by the implementing agency. Please specify.

______

13. I have financial responsibility in accordance with Subpart I. Please specify:

Method: ______

Insurer: ______

Policy Number: ______

14. OATH: I certify that the information concerning installation provided in Item 10 is true to the best of my belief and knowledge.

Installer: ______ Name ______ Date

______ Position

______ Company

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Appendix II to Part 280—List of Agencies Designated To Receive Notifications

Alabama (EPA Form), Alabama Department of Environmental Management, Ground Water Section/Water Division, 1751 Congressman W.L. Dickinson Drive, Montgomery, Alabama 36130, 205/271–7823

Alaska (EPA Form), Department of Environmental Conservation, Box 0, Juneau, Alaska 99811–1800, 970/465–2653

American Samoa (EPA Form), Executive Secretary, Environmental Quality Commission, Office of the Governor, American Samoan Government, Pago Pago, American Samoa 96799; Attention: UST Notification

Arizona (EPA Form), Attention: UST Coordinator, Arizona Department of Environmental Quality, Environmental Health Services, 2005 N. Central, Phoenix, Arizona 85004

Arkansas (EPA Form), Arkansas Department of Pollution Control and Ecology, P.O. Box 9583, Little Rock, Arkansas 72219, 501/562–7444

California (State Form), Executive Director, State Water Resources Control Board, P.O. Box 100, Sacramento, California 95801, 916/445–1533

Co1orado (EPA Form), Section Chief, Colorado Department of Health, Waste Management Division, Underground Tank Program, 4210 East 11th Avenue, Denver, Colorado 80220, 303/320–8333

Connecticut (State Form), Hazardous Materials Management Unit, Department of Environmental Protection, State Office Building, 165 Capitol Avenue, Hartford, Connecticut 06106

Delaware (State Form), Division of Air and Waste Management, Department of Natural Resources and Environmental Control, P.O. Box 1401, 89 Kings Highway, Dover, Delaware 19903, 302/726–5409

District of Columbia (EPA Form), Attention: UST Notification Form, Department of Consumer and Regulatory Affairs, Pesticides and Hazardous Waste Management Branch, Room 114, 5010 Overlook Avenue SW., Washington, DC 20032

Florida (State Form), Florida Department of Environmental Regulation, Solid Waste Section, Twin Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32399, 904/487–4398

Georgia (EPA Form), Georgia Department of Natural Resources, Environmental Protection Division, Underground Storage Tank Program, 3420 Norman Berry Drive, 7th Floor, Hapeville, Georgia 30354, 404/656–7404

Guam (State Form), Administrator, Guam Environmental Protection Agency, P.O. Box 2999, Agana, Guam 96910, Overseas Operator (Commercial call 646–8863)

Hawaii (EPA Form), Administrator, Hazardous Waste Program, 645 Halekauwila Street, Honolulu, Hawaii 96813, 808/548–2270

Idaho (EPA Form), Underground Storage Tank Coordinator, Water Quality Bureau, Division of Environmental Quality, Idaho Department of Health and Welfare, 450 W. State Street, Boise, Idaho 83720, 208/334–4251

Illinois (EPA Form), Underground Storage Tank Coordinator, Division of Fire Prevention, Office of State Fire Marshal, 3150 Executive Park Drive, Springfield, Illinois 62703–4599

Indiana (EPA Form), Underground Storage Tank Program, Office of Environmental Response, Indiana Department of Environmental Management, 105 South Meridian Street, Indianapolis, Indiana 46225

Iowa (State Form), UST Coordinator, Iowa Department of Natural Resources, Henry A. Wallace Building, 900 East Grand, Des Moines, Iowa 50219, 512/281–8135

Kansas (EPA Form), Kansas Department of Health and Environment, Forbes Field, Building 740, Topeka, Kansas 66620, 913/296–1594

Kentucky (State Form), Department of Environmental Protection, Hazardous Waste Branch, Fort Boone Plaza, Building #2, 18 Reilly Road, Frankfort, Kentucky 40601, 501/564–6716

Louisiana (State Form), Secretary, Louisiana Department of Environmental Quality, P.O. Box 44066, Baton Rouge, Louisiana 70804, 501/342–1265

Maine (State Form), Attention: Underground Tanks Program, Bureau of Oil and Hazardous Material Control, Department of Environmental Protection, State House—Station 17, Augusta, Maine 04333

Maryland (EPA Form), Science and Health Advisory Group, Office of Environmental Programs, 201 West Preston Street, Baltimore, Maryland 21201

Massachusetts (EPA Form), UST Registry, Department of Public Safety, 1010 Commonwealth Avenue, Boston, Massachusetts 02215, 617/566–4500

Michigan (EPA Form), Michigan Department of State Police, Fire Marshal Division, General Office Building, 7150 Harris Drive, Lansing, Michigan 48913

Minnesota (State Form), Underground Storage Tank Program, Division of Solid and Hazardous Wastes, Minnesota Pollution Control Agency, 520 West Lafayette Road, St. Paul, Minnesota 55155

Mississippi (State Form), Department of Natural Resources, Bureau of Pollution Control, Underground Storage Tank Section, P.O. Box 10385, Jackson, Mississippi 39209, 601/961–5171

Missouri (EPA Form), UST Coordinator, Missouri Department of Natural Resources, P.O. Box 176, Jefferson City, Missouri 65102, 314/751–7428

Montana (EPA Form), Solid and Hazardous Waste Bureau, Department of Health and Environmental Science, Cogswell Bldg., Room B–201, Helena, Montana 59620

Nebraska (EPA Form), Nebraska State Fire Marshal, P.O. Box 94677, Lincoln, Nebraska 68509–4677, 402/471–9465

Nevada (EPA Form), Attention: UST Coordinator, Division of Environmental Protection, Department of Conservation and Natural Resources, Capitol Complex 201 S. Fall Street, Carson City, Nevada 89710, 800/992–0900, Ext. 4670, 702/885–4670

New Hampshire (EPA Form), NH Dept. of Environmental Services, Water Supply and Pollution Control Division, Hazen Drive, P.O. Box 95, Concord, New Hampshire 03301, Attention: UST Registration

New Jersey (State Form), Underground Storage Tank Coordinator, Department of Environmental Protection, Division of Water Resources (CN–029), Trenton, New Jersey 08625, 609/292–0424

New Mexico (EPA Form), New Mexico Environmental Improvement Division, Groundwater/Hazardous Waste Bureau, P.O. Box 968, Santa Fe, New Mexico 37504, 505/827–2933

New York (EPA Form), Bulk Storage Section, Division of Water, Department of Environmental Conservation, 50 Wolf Road, Room 326, Albany, New York 12233–0001, 518/457–4351

North Carolina (EPA Form), Division of Environmental Management, Ground-Water Operations Branch, Department of Natural Resources and Community Development, P.O. Box 27687, Raleigh, North Carolina 27611, 919/733–3221

North Dakota (State Form), Division of Hazardous Management and Special Studies, North Dakota Department of Health, Box 5520, Bismarck, North Dakota 58502–5520

Northern Mariana Islands (EPA Form), Chief, Division of Environmental Quality, P.O. Box 1304, Commonwealth of Northern Mariana Islands, Saipan, CM 96950, Cable Address: Gov. NMI Saipan, Overseas Operator: 6984

Ohio (State Form), State Fire Marshal's Office, Department of Commerce, 8895 E. Main Street, Reynoldsburg, Ohio 43068, State Hotline: 800/282–1927

Oklahoma (EPA Form), Underground Storage Tank Program, Oklahoma Corporation Comm., Jim Thorpe Building, Oklahoma City, Oklahoma 73105

Oregon (State Form), Underground Storage Tank Program, Hazardous and Solid Waste Division, Department of Environmental Quality, 811 S.W. Sixth Avenue, Portland, Oregon 98204, 503/229–5788

Pennsylvania (EPA Form), PA Department of Environmental Resources, Bureau of Water Quality Management, Ground Water Unit, 9th Floor Fulton Building, P.O. Box 2063, Harrisburg, Pennsylvania 17120

Puerto Rico (EPA Form), Director, Water Quality Control Area, Environmental Quality Board, Commonwealth of Puerto Rico, Santurce, Puerto Rico, 809/725–0717

Rhode Island (EPA Form), UST Registration, Department of Environmental Management, 83 Park Street, Providence, Rhode Island 02903, 401/277–2234

South Carolina (State Form), Ground-Water Protection Division, South Carolina Department of Health and Environmental Control, 2600 Bull Street, Columbia, South Carolina 29201, 803/758–5213

South Dakota (EPA Form), Office of Water Quality, Department of Water and Natural Resources, Joe Foss Building, Pierre, South Dakota 57501,

Tennessee (EPA Form), Tennessee Department of Health and Environment, Division of Superfund Underground Storage Tank Section, 150 Ninth Avenue, North, Nashville, Tennessee 37219–5404, 615/741–0690

Texas (EPA Form), Underground Storage Tank Program, Texas Water Commission, P.O. Box 13087, Austin, Texas 78711

Utah (EPA Form), Division of Envirormental Health, P.O. Box 45500, Salt Lake City, Utah 84145–0500

Vermont (State Form), Underground Storage Tank Program, Vermont AEC/Waste Management Division, State Office Building, Montpelier, Vermont 05602, 802/828–3395

Virginia (EPA Form), Virginia Water Control Board, P.O. Box 11143, Richmond, Virginia 23230–1143, 804/257–6685

Virgin Islands (EPA Form), 205(J) Coordinator, Division of Natural Resources Management, 14 F Building 111, Watergut Homes, Christianstead, St. Croix, Virgin Islands 00820

Washington (State Form), Underground Storage Tank Notification, Solid and Hazardous Waste Program, Department of Ecology, M/S PV–11, Olympia, Washington 98504–8711, 206/459–6316

West Virginia (EPA Form), Attention: UST Notification, Solid and Hazardous Waste, Ground Water Branch, West Virginia Department of Natural Resources, 1201 Greenbriar Street, Charleston, West Virginia 25311

Wisconsin (State Form), Bureau of Petroleum Inspection, P.O. Box 7969, Madison, Wisconsin 53707, 608/266–7605

Wyoming (EPA Form), Water Quality Division, Department of Environmental Quality, Herschler Building, 4th Floor West, 122 West 25th Street, Cheyenne, Wyoming 82002, 307/777–7781.

Appendix III to Part 280—Statement for Shipping Tickets and Invoices

Note. A Federal law (the Resource Conservation and Recovery Act (RCRA), as amended (Pub. L. 98–616)) requires owners of certain underground storage tanks to notify designated State or local agencies by May 8, 1986, of the existence of their tanks. Notifications for tanks brought into use after May 8, 1986, must be made within 30 days. Consult EPA's regulations, issued on November 8, 1985 (40 CFR part 280) to determine if you are affected by this law.

NFPA® 30

Flammable and Combustible Liquids Code

2008 Edition

This edition of NFPA 30, *Flammable and Combustible Liquids Code*, was prepared by the Technical Committee on Fundamentals, the Technical Committee on Operations, the Technical Committee on Storage and Warehousing of Containers and Portable Tanks, and the Technical Committee on Tank Storage and Piping Systems, and released by the Technical Correlating Committee on Flammable and Combustible Liquids. It was issued by the Standards Council on July 26, 2007, with an effective date of August 15, 2007, and supersedes all previous editions.

This edition of NFPA 30 was approved as an American National Standard on August 15, 2007.

Origin and Development of NFPA 30

From 1913 to 1957, this document was written as a model municipal ordinance known as the *Suggested Ordinance for the Storage, Handling, and Use of Flammable Liquids*. In 1957, the format was changed to a code, although the technical requirements and provisions remained the same. During its 90-year existence, numerous revised editions have been published as dictated by experience and advances in technology.

A brief review of the major changes adopted over the previous seven editions follows. In 1984, the chapter covering automotive and marine service stations was removed from NFPA 30 and was used as the basis for a separate document, NFPA 30A, *Automotive and Marine Service Station Code*, now titled *Code for Motor Fuel Dispensing Facilities and Repair Garages*. In 1987, Chapter 5 (Industrial Plants), Chapter 6 (Bulk Plants and Terminals), Chapter 7 (Process Plants), and Chapter 8 (Refineries, Chemical Plants, and Distilleries) were combined into a single chapter on operations. In 1990, a new section was added to Chapter 4 to address hazardous materials storage lockers, and more detailed guidance was added to Section 5-3 to address ventilation of enclosed process areas and for estimation of fugitive emissions. In 1993, Chapter 2, Tank Storage, was amended to allow combined remote impounding and diking systems and to provide relief from the spill control requirements for certain secondary containment–type tanks. Also, Chapter 4, Container and Portable Tank Storage, was completely rewritten so that its requirements were presented more clearly, especially for mercantile occupancies.

In 1996, the following major changes were incorporated: requirements for temporary and permanent closure of underground storage tanks; requirements for tightness testing of tanks of specific design; recognition of intermediate bulk containers; and mandatory fire protection design criteria for inside storage of liquids in storage rooms and liquid warehouses.

In 2000, the following major changes were incorporated: complete editorial rewrites of Chapter 2, Tank Storage, and Chapter 3, Piping Systems; requirements for vaults for aboveground tanks and for protected aboveground tanks; recognition of certain nonmetallic intermediate bulk containers for Class II and Class III liquids, along with fire protection system design criteria for them; simplified spill containment and drainage requirements; new fire protection design criteria for a number of flammable and combustible liquid commodities; expansion of the requirements for construction and separation of process buildings; a new section addressing recirculating heat transfer fluid heating systems; a new section addressing solvent recovery distillation units; and consolidation into a new Chapter 6 of all requirements for hazardous location electrical area classification.

The 2003 edition of NFPA 30 incorporated the following changes:

(1) All mandatory referenced publications were relocated to Chapter 2, and all definitions relocated to Chapter 3. All subsequent chapters were renumbered accordingly.

(2) Numerous occupancy definitions were either added or corrected to correlate with NFPA 1, *Uniform Fire Code*™; NFPA *101*®, *Life Safety Code*®; and *NFPA 5000*®, *Building Construction and Safety Code*®.

(3) Separation distance requirements for protected aboveground tanks were reduced, and separation distance requirements for tanks in vaults were eliminated.

(4) Special operating requirements were added for shop-fabricated aboveground tanks with abnormally long vertical piping for fill and/or vent lines.

(5) New criteria were added to Chapter 6, Container and Portable Tank Storage, for maximum allowable container sizes.

(6) Fire protection design criteria for unsaturated polyester resins were added.

(7) Section D.5, which contains suggested fire protection design criteria using high-expansion foam systems for protection of liquids in 1-gallon plastic containers, was added.

(8) Revisions were made to the spacing requirements and construction requirements for process buildings.

(9) Special requirements were added for insulated piping for recirculating heat transfer systems.

(10) Permanent interconnections between fire water systems and process water systems were prohibited.

The 2008 edition of NFPA 30 represents a complete editorial revision of the prior 2003 edition to implement NFPA’s hazardous materials template, a formatting scheme intended to integrate a common organization and common outline for all NFPA codes and standards that address the various types of hazardous materials. As a result of the implementation of the template, the eight chapters that comprised the 2003 edition of NFPA 30 have been subdivided into 29 shorter, more narrowly focused chapters. Code requirements that are generally applicable to all facilities that store, handle, and use flammable and combustible liquids have been relocated to the beginning of NFPA 30. Chapters dealing with bulk storage and bulk handling of liquids have been moved to the end of NFPA 30, based on the reasoning that not all codes and standards dealing with hazardous materials include provisions for bulk storage.

In addition to the major editorial revision, the 2008 edition of NFPA 30 incorporates the following significant technical changes:

(1) Several new definitions have been added to Chapter 3 to assist the user in applying the requirements of the code. Some existing definitions in Chapter 3 have been changed to read the same as the preferred definitions in the NFPA *Glossary of Terms*. Where possible, secondary definitions have been moved to appropriate chapters.

(2) New corrosion protection requirements have been added for nonmetallic tanks (21.4.5).

(3) The requirements for construction of vaults (Section 25.5) have been improved for clarity.

(4) Additional requirements for fire-resistant tanks have been added (Section 22.9).

(5) The maximum capacity for secondary containment–type tanks storing Class II and Class IIIA liquids has been increased from 12,000 gal to 20,000 gal (from 45,000 L to 76,000 L) (22.11.4).

(6) New requirements for periodic testing, maintenance, inspection, and repair of aboveground storage tanks have been added (Sections 21.5, 21.8, and 22.17).

(7) Overfill prevention requirements have been revised so that they apply to all tanks larger than 1320 gal (5000 L) capacity (21.7.1).

(8) Special requirements for marine piping systems have been added (Section 27.11).

(9) Chapter 6, Container and Portable Tank Storage, as written in the 2003 edition, has been completely replaced by Chapters 9 through 16 of this edition. These new chapters regulate storage of containers, portable tanks, and intermediate bulk containers in a manner that is consistent with model building codes, such as *NFPA 5000®, Building Construction and Safety Code®*, and model fire prevention codes, such as NFPA 1, *Uniform Fire Code*™, and incorporate the concepts of maximum allowable quantities (MAQs), control areas, and protection levels.

(10) Fire protection design criteria for inside storage areas have been expanded to include requirements for small plastic containers of Class IB, IC, II, and III liquids in corrugated cartons and for Class IIIB liquids in corrugated cardboard intermediate bulk containers with plastic inner liners (Chapter 16).

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NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on safeguarding against the fire and explosion hazards associated with the storage, handling, and use of flammable and combustible liquids; and classifying flammable and combustible liquids.

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NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents or portions of documents on the basic requirements for safeguarding against the fire and explosion hazards associated with the storage and handling of flammable and combustible liquids. This Committee shall also have responsibility for definitions related to flammable and combustible liquids and for criteria for the classification of flammable and combustible liquids.

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NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents or portions of documents on safeguarding against the fire and explosion hazards associated with operations that involve the handling, transfer, and use of flammable and combustible liquids, either as a principal activity or as an incidental activity.

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NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents or portions of documents on safeguarding against the fire and explosion hazards associated with the storage, warehousing, and display merchandising of flammable and combustible liquids in containers and in portable tanks whose capacity does not exceed 660 gal (2500 L).

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James D. Kieffer, Kieffer & Associates, Incorporated, Canada [SE]

David C. Kirby, Baker Engineering & Risk Consultants, WV [SE]

Gregory D. Kirby, CYTEC Industries, Incorporated, WV [U]
Rep. American Chemistry Council

Susan M. Preske, St. Paul Travelers, NY [I]

Robert N. Renkes, Petroleum Equipment Institute, OK [M]

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Robert P. Benedetti, NFPA Staff Liaison

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NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents or portions of documents on safeguarding against the fire and explosion hazards associated with the storage of flammable and combustible liquids in fixed aboveground and underground tanks of any size, including tanks in buildings, except as specifically covered by other NFPA documents, and with the installation of piping systems for flammable and combustible liquids. This Committee shall also have primary responsibility for documents or portions of documents on safeguarding against the fire and explosion hazards associated with the storage of flammable and combustible liquids in portable tanks whose capacity exceeds 660 gal (2500 L).

NFPA 30
Flammable and Combustible Liquids Code
2008 Edition

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obtained on request from NFPA or viewed at www.nfpa.org/disclaimers.

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

Changes to the content of this code have not been marked by vertical rules and deletion bullets due to the fact that the entire document has undergone restructuring.

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex H. Editorial changes to extracted material consist of revising references to an appropriate division in this document or the inclusion of the document number with the division number when the reference is to the original document. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex H.

Chapter 1 Administration

1.1 Scope.

1.1.1* This code shall apply to the storage, handling, and use of flammable and combustible liquids, including waste liquids, as herein defined and classified.

1.1.2 This code shall not apply to the following:

(1)* Any liquid that has a melting point of 100°F (37.8°C) or greater

(2)* Any liquid that does not meet the criteria for fluidity given in the definition of *liquid* in Chapter 3 and in the provisions of Chapter 4

(3) Any cryogenic fluid or liquefied gas, as defined in Chapter 3

(4)* Any liquid that does not have a flash point, but which is capable of burning under certain conditions

(5)* Any aerosol product

(6) Any mist, spray, or foam

(7)* Transportation of flammable and combustible liquids as governed by the U.S. Department of Transportation

(8)* Storage, handling, and use of fuel oil tanks and containers connected with oil-burning equipment

1.2* Purpose.

The purpose of this code shall be to provide fundamental safeguards for the storage, handling, and use of flammable and combustible liquids.

1.3 Application.

The requirements in this code shall apply to users, producers, distributors, and others who are involved with the storage, handling, or use of flammable and combustible liquids.

1.3.1 Chapters 1 through 7 shall apply to all facilities where flammable or combustible liquids are stored, handled, or used.

1.3.2 Chapters 9 through 12 shall apply to the storage of flammable or combustible liquids in containers, portable tanks, and intermediate bulk containers in the occupancies covered by the scope of each chapter.

1.3.3 Chapter 13 shall apply to the storage of flammable or combustible liquids in containers, portable tanks, and intermediate bulk containers in detached unprotected buildings.

1.3.4 Chapter 14 shall apply to the storage of flammable or combustible liquids in containers, portable tanks, and intermediate bulk containers in hazardous materials storage lockers.

1.3.5 Chapter 15 shall apply to the outdoor storage of flammable or combustible liquids in containers, portable tanks, and intermediate bulk containers.

1.3.6 Chapter 16 shall apply to fire protection design criteria used to protect storage of flammable or combustible liquids in containers, portable tanks, and intermediate bulk containers.

1.3.7 Chapter 17 shall apply to the design and construction of facilities where flammable or combustible liquids are processed or used.

1.3.8 Chapter 18 shall apply to the general requirements related to handling, dispensing, transfer, and use of flammable or combustible liquids.

1.3.9 Chapter 19 shall apply to specific equipment and specific operations that use flammable or combustible liquids.

1.3.10 Chapters 21 through 25 shall apply to bulk storage of flammable or combustible liquids in tanks.

1.3.11 Chapter 27 shall apply to piping systems for transferring flammable or combustible liquids.

1.3.12 Chapter 28 shall apply to loading and unloading systems associated with bulk storage of flammable or combustible liquids in tanks.

1.3.13 Chapter 29 shall apply to wharves associated with bulk handling of flammable or combustible liquids.

1.4 Retroactivity.

The provisions of this code reflect a consensus of what is necessary to provide an acceptable degree of protection from the hazards addressed in this code at the time the code was issued.

1.4.1 Unless otherwise specified, the provisions of this code shall not apply to facilities, equipment, structures, or installations that existed or were approved for construction or installation prior to the effective date of the code. Where specified, the provisions of this code shall be retroactive.

1.4.2* In those cases where the authority having jurisdiction determines that the existing situation presents an unacceptable degree of risk, the authority having jurisdiction shall be permitted to apply retroactively any portion of this code deemed appropriate.

1.4.3 The retroactive requirements of this code shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction, and only where it is clearly evident that a reasonable degree of safety is provided.

1.5 Equivalency.

Nothing in this code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this code. Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency. The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

1.5.1 The provisions of this code shall be permitted to be altered at the discretion of the authority having jurisdiction after consideration of special situations, such as topographical conditions of the site, presence or absence of protective features (e.g., barricades, walls, etc.), adequacy of building exits, the nature of the occupancy, proximity to buildings or adjoining property and the construction of such buildings, capacity and construction of proposed storage tanks and the nature of the liquids to be stored, the nature of the process, the degree to which private fire protection is provided, and the capabilities of the local fire department. Such alternate arrangements shall provide protection at least equivalent to that required by this code.

1.5.2 The provisions of this code shall also be permitted to be altered at the discretion of the authority having jurisdiction in cases where other regulations, such as those for environmental protection, impose requirements that are not anticipated by this code. Such alternate arrangements shall provide protection at least equivalent to that required by this code.

1.5.3 Installations made in accordance with the applicable requirements of the following standards shall be deemed to be in compliance with this code:

(1) NFPA 1, *Uniform Fire Code*

(2) NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*

(3) NFPA 31, *Standard for the Installation of Oil-Burning Equipment*

(4) NFPA 32, *Standard for Drycleaning Plants*

(5) NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*

(6) NFPA 34, *Standard for Dipping and Coating Processes Using Flammable or Combustible Liquids*

(7) NFPA 35, *Standard for the Manufacture of Organic Coatings*

(8) NFPA 36, *Standard for Solvent Extraction Plants*

(9) NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines*

(10) NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*

(11) Chapter 10 of NFPA 99, *Standard for Health Care Facilities*

(12) *NFPA 5000, Building Construction and Safety Code*

1.6 Symbols, Units, and Formulas.

1.6.1 The units of measure in this code are presented first in U.S. customary units (inch-pound units). SI units (International System of Units) follow the inch-pound units in parentheses.

1.6.2 Either system of units shall be acceptable for satisfying the requirements in the code.

1.6.3 Users of this code shall apply one system of units consistently and shall not alternate between units.

1.6.4 The values presented for measurements in this code are expressed with a degree of precision appropriate for practical application and enforcement. It is not intended that the application or enforcement of these values be more precise than the precision expressed.

1.6.5 Where extracted text contains values expressed in only one system of units, the values in the extracted text have been retained without conversion to preserve the values established by the responsible technical committee in the source document.

1.6.6 If a value for measurement given in this standard is followed by an equivalent value in other units, the first stated shall be regarded as the requirement. The given equivalent value shall be considered to be approximate.

1.7 Code Adoption Requirements. (Reserved)

1.8 Permits. (Reserved)

1.9 Enforcement.

This code shall be administered and enforced by the authority having jurisdiction designated by the governing authority. *(See Annex G for sample wording for enabling legislation.)*

Chapter 2 Referenced Publications

2.1 General.

The documents or portions thereof listed in this chapter are referenced within this code and shall be considered part of the requirements of this document.

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1, *Uniform Fire Code™*, 2006 edition.

NFPA 10, *Standard for Portable Fire Extinguishers,* 2007 edition.

NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam,* 2005 edition.

NFPA 12, *Standard on Carbon Dioxide Extinguishing Systems,* 2008 edition.

NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems,* 2004 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems,* 2007 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems,* 2007 edition.

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection,* 2007 edition.

NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems,* 2007 edition.

NFPA 17, *Standard for Dry Chemical Extinguishing Systems,* 2002 edition.

NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances,* 2007 edition.

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems,* 2008 edition.

NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages,* 2008 edition.

NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products,* 2007 edition.

NFPA 31, *Standard for the Installation of Oil-Burning Equipment,* 2006 edition.

NFPA 32, *Standard for Drycleaning Plants,* 2007 edition.

NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials,* 2007 edition.

NFPA 34, *Standard for Dipping and Coating Processes Using Flammable or Combustible Liquids,* 2007 edition.

NFPA 35, *Standard for the Manufacture of Organic Coatings,* 2005 edition.

NFPA 36, *Standard for Solvent Extraction Plants,* 2004 edition.

NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines,* 2006 edition.

NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals,* 2004 edition.

NFPA 58, *Liquefied Petroleum Gas Code,* 2008 edition.

NFPA 59A, *Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG),* 2006 edition.

NFPA 68, *Standard on Explosion Protection by Deflagration Venting,* 2007 edition.

NFPA 69, *Standard on Explosion Prevention Systems,* 2008 edition.

NFPA 70, *National Electrical Code®,* 2008 edition.

NFPA 80, *Standard for Fire Doors and Other Opening Protectives,* 2007 edition.

NFPA 85, *Boiler and Combustion Systems Hazards Code,* 2007 edition.

NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids,* 2004 edition.

NFPA 99, *Standard for Health Care Facilities,* 2005 edition.

NFPA *101*®, *Life Safety Code*®, 2006 edition.

NFPA 220, *Standard on Types of Building Construction,* 2006 edition.

NFPA 221, *Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls,* 2006 edition.

NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials,* 2006 edition.

NFPA 303, *Fire Protection Standard for Marinas and Boatyards,* 2006 edition.

NFPA 307, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves,* 2006 edition.

NFPA 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair,* 2005 edition.

NFPA 505, *Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations,* 2006 edition.

NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response,* 2007 edition.

NFPA 2001, *Standard on Clean Agent Fire Extinguishing Systems,* 2008 edition.

NFPA 5000®, *Building Construction and Safety Code*®, 2006 edition.

2.3 Other Publications.

2.3.1 API Publications.

American Petroleum Institute, 1220 L Street, NW, Washington, DC 20005-4070.

API Specification 12B, *Bolted Tanks for Storage of Production Liquids*, 14th edition, 1995.

API Specification 12D, *Field Welded Tanks for Storage of Production Liquids*, 10th edition, 1994.

API Specification 12F, *Shop Welded Tanks for Storage of Production Liquids*, 11th edition, 1994.

API 620, *Recommended Rules for the Design and Construction of Large, Welded, Low-Pressure Storage Tanks,* 10th edition, 2002.

API Standard 650, *Welded Steel Tanks for Oil Storage*, 10th edition, 1998.

API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction,* 3rd edition, 2001.

API Standard 2000, *Venting Atmospheric and Low-Pressure Storage Tanks*, 5th edition, 1998.

API 2350, *Overfill Protection for Storage Tanks in Petroleum Facilities*, 3rd edition, 2005.

2.3.2 ASME Publications.

American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990.

ASME *Boiler and Pressure Vessel Code*, 2007.

ASME B31, *Code for Pressure Piping*, 2006.

ASME *Code for Unfired Pressure Vessels*, 2007.

2.3.3 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM A 395, *Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures*, 1999.

ASTM D 5, *Standard Test Method for Penetration of Bituminous Materials*, 2006.

ASTM D 56, *Standard Test Method for Flash Point by Tag Closed Cup Tester*, 2005.

ASTM D 86, *Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure*, 2005.

ASTM D 92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester*, 2005.

ASTM D 93, *Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester*, 2002.

ASTM D 323, *Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method)*, 2006.

ASTM D 3278, *Standard Test Methods for Flash Point of Liquids by Small Scale Closed Cup Apparatus*, 1996.

ASTM D 3828, *Standard Test Methods for Flash Point by Small Scale Closed Cup Tester*, 2005.

ASTM D 4359, *Standard Test for Determining Whether a Material is a Liquid or a Solid*, 1999.

ASTM F 852, *Standard Specification for Portable Gasoline Containers for Consumer Use*, 1999.

ASTM F 976, *Specification for Portable Kerosine and Diesel Containers for Consumer Use*, 2002.

2.3.4 FM Publications.

FM Global, 1301 Atwood Avenue, P.O. Box 7500, Johnston, RI 02919.

Approval Standard for Safety Containers and Filling, Supply, and Disposal Containers — Class Numbers 6051 and 6052, May 1976.

FM Global Approval, *Examination Program for Fusible Closures for Steel Drums*, Class Number 6083, October 2006.

2.3.5 NMFTA Publications.

National Motor Freight Traffic Association, 1001 North Fairfax Street, Suite 600, Alexandria, VA 22314.

National Motor Freight Classification, 2006.

2.3.6 NRFC Publications.

National Railroad Freight Committee, 222 South Riverside Plaza, Chicago, IL 60606-5945.

Uniform Freight Classification.

2.3.7 STI Publications.

Steel Tank Institute, 570 Oakwood Road, Lake Zurich, IL 60047.

STI SP001, *Standard for the Inspection of Aboveground Storage Tanks*, 2006.

2.3.8 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 30, *Standard for Metal Safety Cans*, 2004.

UL 58, *Standard for Steel Underground Tanks for Flammable and Combustible Liquids*, 1998.

ANSI/UL 80, *Standard for Steel Tanks for Oil Burner Fuel*, 2004.

ANSI/UL 142, *Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids*, 2002.

UL 971, *Standard for Nonmetallic Underground Piping for Flammable Liquids*, 2005.

ANSI/UL 1313, *Standard for Nonmetallic Safety Cans for Petroleum Products*, 2003.

ANSI/UL 1314, *Standard for Special Purpose Metal Containers*, 2005.

ANSI/UL 1316, *Standard for Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures*, 2006.

ANSI/UL 1746, *Standard for External Corrosion Protection Systems for Steel Underground Storage Tanks*, 2002.

UL 2080, *Standard for Fire Resistant Tanks for Flammable and Combustible Liquids*, 2000.

ANSI/UL 2085, *Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids*, 1999.

ANSI/UL 2208, *Standard for Solvent Distillation Units*, 2005.

ANSI/UL 2245, *Standard for Below-Grade Vaults for Flammable Liquid Storage Tanks*, 1999.

UL 2368, *Standard for Fire Exposure Testing of Intermediate Bulk Containers for Flammable and Combustible Liquids*, 2001.

2.3.9 UN Publications.

United Nations, Headquarters, New York, NY 10017.

Recommendations on the Transport of Dangerous Goods, 14th revised edition, 2005.

2.3.10 U.S. Government Publications.

U.S. Government Printing Office, Washington, DC 20402.

Title 33, Code of Federal Regulations, “Navigation and Navigable Waters,” Parts 154, 155, and 156.

Title 46, Code of Federal Regulations, “Shipping,” Parts 30, 32, 35, and 39.

Title 49, Code of Federal Regulations, “Transportation,” Parts 100 through 199.

2.3.11 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products,* 2007 edition.

NFPA 52, *Vehicular Fuel Systems Code,* 2006 edition.

NFPA 55, *Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks,* 2005 edition.

NFPA *101*®, *Life Safety Code*®, 2006 edition.

NFPA 307, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves,* 2006 edition.

NFPA 1141, *Standard for Fire Protection Infrastructure for Land Development in Suburban and Rural Areas,* 2008 edition.

NFPA 5000®, *Building Construction and Safety Code*®, 2006 edition.

Chapter 3 Definitions

3.1 General.

The definitions contained in this chapter shall apply to the terms used in this code. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary,* 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3* Code. A standard that is an extensive compilation of provisions covering broad subject matter or that is suitable for adoption into law independently of other codes and standards.

3.2.4 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.5* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.3 General Definitions.

3.3.1 Area.

3.3.1.1 Control Area. A building or portion of a building within which flammable and combustible liquids are allowed to be stored, dispensed, and used or handled in quantities that do not exceed the maximum allowable quantity (MAQ). [***5000,*** 2006] *(See also 3.3.34, Maximum Allowable Quantity.)*

3.3.1.2 Fire Area. An area of a building separated from the remainder of the building by construction having a fire resistance of at least 1 hour and having all communicating openings properly protected by an assembly having a fire resistance rating of at least 1 hour.

3.3.1.3 Inside Liquid Storage Area. A room or building used for the storage of liquids in containers or portable tanks, separated from other types of occupancies.

3.3.2 Barrel. A unit of volume used in the petroleum industry that is equal to 42 gal (159 L).

3.3.3 Basement. For the purposes of this code, a story of a building or structure having one-half or more of its height below ground level and to which access for fire-fighting purposes is restricted.

3.3.4 Boiling Point. The temperature at which the vapor pressure of a liquid equals the surrounding atmospheric pressure.

3.3.5* Boil-Over. An event in the burning of certain oils in an open-top tank when, after a long period of quiescent burning, there is a sudden increase in fire intensity associated with expulsion of burning oil from the tank.

3.3.6 Building. A structure, usually enclosed by walls and a roof, constructed to provide support or shelter for an intended occupancy. [**1141**, 2008]

3.3.6.1* Important Building. A building that is considered not expendable in an exposure fire.

3.3.6.2 Storage Tank Building. A three-dimensional space that is enclosed by a roof and walls that cover more than one-half of the possible area of the sides of the space, is of sufficient size to allow entry by personnel, will likely limit the dissipation of heat or dispersion of vapors, and restricts access for fire fighting.

3.3.7 Building Code. The building code referenced in Chapter 2 of this code.

3.3.8 Chemical Plant. A large integrated plant or that portion of such a plant, other than a refinery or distillery, where liquids are produced by chemical reactions or used in chemical reactions.

3.3.9 Closed-Top Diking. A dike with a cover intended to minimize the entrance of precipitation into the diked area.

3.3.10* Container. Any vessel of 119 gal (450 L) or less capacity used for transporting or storing liquids.

3.3.10.1 Closed Container. A container as herein defined, so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

3.3.10.2 Intermediate Bulk Container. Any closed vessel having a liquid capacity not exceeding 3000 L (793 gal) and intended for storing and transporting liquids, as defined in Title 49, Code of Federal Regulations, Parts 100 through 199 or in Part 6 of the United Nations' *Recommendations on the Transport of Dangerous Goods*.

3.3.10.3* Nonmetallic Container. A container as defined in 3.3.10, constructed of glass, plastic, fiber, or a material other than metal.

3.3.10.4* Nonmetallic Intermediate Bulk Container. An intermediate bulk container, as defined in 3.3.10.2, constructed of glass, plastic, fiber, or a material other than metal.

3.3.11 Crude Petroleum. Hydrocarbon mixtures that have a flash point below 150°F (65.6°C) and that have not been processed in a refinery.

3.3.12 Cryogenic Fluid. A fluid with a boiling point lower than -90°C (-130°F) at an absolute pressure of 101.325 kPa (14.7 psi). [**55,** 2005]

3.3.13 Damage-Limiting Construction. For the purposes of this code, any set of construction elements, used individually or in combination, which will act to limit damage from an explosion, including open structures, pressure relieving construction, or pressure resistant construction.

3.3.14 Distillery. A plant or that portion of a plant where liquids produced by fermentation are concentrated and where the concentrated products are also mixed, stored, or packaged.

3.3.15 Dwelling.

3.3.15.1 Multifamily Dwelling. A building that contains three or more dwelling units.

3.3.15.2 One-Family Dwelling. A building that consists solely of one dwelling unit.

3.3.15.3 Two-Family Dwelling. A building that consists solely of two dwelling units.

3.3.16 Dwelling Unit. One or more rooms arranged for the use of one or more individuals living together, providing complete, independent living facilities, including permanent provisions for sleeping, eating, cooking, and sanitation. [***5000,*** 2006]

3.3.17 Fire Code. The fire code referenced in Chapter 2 of this code.

3.3.18 Fire Point. The lowest temperature at which a liquid will ignite and achieve sustained burning when exposed to a test flame in accordance with ASTM D 92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester*.

3.3.19 Flash Point. The minimum temperature of a liquid at which sufficient vapor is given off to form an ignitible mixture with the air, near the surface of the liquid or within the vessel used, as determined by the appropriate test procedure and apparatus specified in Section 4.4.

3.3.20* Fugitive Emissions. Releases of flammable vapor that continuously or intermittently occur from process equipment during normal operations.

3.3.21* Hazardous Material or Hazardous Chemical. Material presenting dangers beyond the fire problems relating to flash point and boiling point.

3.3.22 Hazardous Materials Storage Locker. A movable prefabricated structure, manufactured primarily at a site other than the final location of the structure and transported completely assembled or in a ready-to-assemble package to the final location, and intended to meet local, state, and federal requirements for outside storage of hazardous materials.

3.3.23* Hazardous Reaction or Hazardous Chemical Reaction. Reactions that result in dangers beyond the fire problems relating to flash point and boiling point of either the reactants or of the products.

3.3.24 Heat Transfer Fluid (HTF). A liquid that is used as a medium to transfer heat energy from a heater or vaporizer to a remote heat consumer (e.g., injection molding machine, oven, or dryer, or jacketed chemical reactor).

3.3.25 High Hazard Level 2 Contents. Contents that present a deflagration hazard or a hazard from accelerated burning. For the purposes of this code, this includes Class I, Class II, or Class IIIA liquids that are used or stored in normally open containers or systems, or in closed containers or systems at gauge pressures 15 psi (103 kPa) or greater.

3.3.26 High Hazard Level 3 Contents. Contents that readily support combustion or that present a physical hazard. For the purposes of this code, this includes Class I, Class II, or Class IIIA liquids that are used or stored in normally closed containers or in closed systems at gauge pressures of less than 15 psi (103 kPa).

3.3.27 Hotel. A building or groups of buildings under the same management in which there are sleeping accommodations for more than 16 persons and primarily used by transients for lodging with or without meals. [***101,*** 2006]

3.3.28 Incidental Liquid Use or Storage. Use or storage as a subordinate activity to that which establishes the occupancy or area classification.

3.3.29 Liquefied Gas. A gas, other than in solution, that in a packaging under the charged pressure exists both as a liquid and a gas at a temperature of 68°F (20°C).

3.3.30 Liquid. Any material that (1) has a fluidity greater than that of 300 penetration asphalt when tested in accordance with ASTM D 5, *Standard Test Method for Penetration of Bituminous Materials,* or (2) is a viscous substance for which a specific melting point cannot be determined but that is determined to be a liquid in accordance with ASTM D 4359, *Standard Test for Determining Whether a Material is a Liquid or a Solid*.

3.3.30.1 Combustible Liquid. Any liquid that has a closed-cup flash point at or above 100°F (37.8°C), as determined by the test procedures and apparatus set forth in Section 4.4. Combustible liquids are classified according to Section 4.3.

3.3.30.2* Flammable Liquid. Any liquid that has a closed-cup flash point below 100°F (37.8°C), as determined by the test procedures and apparatus set forth in Section 4.4, and a Reid vapor pressure that does not exceed an absolute pressure of 40 psi (276 kPa) at 100°F (37.8°C), as determined by ASTM D 323, *Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method)*. Flammable liquids are classified according to Section 4.3.

3.3.30.3 Stable Liquid. Any liquid not defined as unstable.

3.3.30.4 Unstable Liquid. A liquid that, in the pure state or as commercially produced or transported, will vigorously polymerize, decompose, undergo condensation reaction, or become self-reactive under conditions of shock, pressure, or temperature.

3.3.30.5* Water-Miscible Liquid. A liquid that mixes in all proportions with water without the use of chemical additives, such as emulsifying agents.

3.3.31 Liquid Storage Room. A room that is used for the storage of liquids in containers, portable tanks, or intermediate bulk containers, has a floor area that does not exceed 500 ft^2, and might be totally enclosed within a building — that is, the room might have no exterior walls.

3.3.32 Liquidtight. The ability of an enclosure or device to prevent the unintended release of liquids at normal operating temperature and pressure ranges.

3.3.33 Liquid Warehouse. See 3.3.58.2.

3.3.34* Maximum Allowable Quantity (MAQ). For the purposes of this code, the quantity of flammable and combustible liquid permitted in a control area.

3.3.35 Occupancy. The purpose for which a building or portion thereof is used or intended to be used. [***101,*** 2006]

3.3.35.1 Ambulatory Health Care Occupancy. A building or portion thereof used to provide services or treatment simultaneously to four or more patients that provides, on an outpatient basis, one or more of the following: (1) treatment for patients that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others; (2) anesthesia that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others; (3) emergency or urgent care for patients who, due to the nature of their injury or illness, are incapable of taking action for self-preservation under emergency conditions without the assistance of others. [***101,*** 2006]

3.3.35.2 Assembly Occupancy. An occupancy (1) used for a gathering of 50 or more persons for deliberation, worship, entertainment, eating, drinking, amusement, awaiting transportation, or similar uses; or (2) used as a special amusement building, regardless of occupant load. [***101,*** 2006]

3.3.35.3 Business Occupancy. An occupancy used for account and record keeping or the transaction of business other than mercantile. [***101,*** 2006]

3.3.35.4 Day-Care Occupancy. An occupancy in which four or more clients receive care, maintenance, and supervision, by other than their relatives or legal guardians, for less than 4 hours per day. [***101,*** 2006]

3.3.35.5 Detention and Correctional Occupancy. An occupancy used to house four or more persons under varied degrees of restraint or security where such occupants are mostly incapable of self-preservation because of security measures not under the occupants' control. [***101,*** 2006]

3.3.35.6 Educational Occupancy. An occupancy used for educational purposes through the twelfth grade by six or more persons for 4 or more hours per day or more than 12 hours per week. [***101,*** 2006]

3.3.35.7 Health Care Occupancy. An occupancy used for purposes of medical or other treatment or care of four or more persons where such occupants are mostly incapable of self-preservation due to age, physical or mental disability, or because of security measures not under the occupants' control. [***101,*** 2006]

3.3.35.8 Industrial Occupancy. An occupancy in which products are manufactured or in which processing, assembling, mixing, packaging, finishing, decorating, or repair operations are conducted. [***101,*** 2006]

3.3.35.9 Mercantile Occupancy. An occupancy used for the display and sale of merchandise. [***101,*** 2006]

3.3.35.10 Residential Occupancy. An occupancy that provides sleeping accommodations for purposes other than health care or detention and correctional. [***101,*** 2006]

3.3.35.11 Residential Board and Care Occupancy. A building or portion thereof that is used for lodging and boarding of four or more residents, not related by blood or marriage to the owners or operators, for the purpose of providing personal care services. [***101,*** 2006]

3.3.35.12 Storage Occupancy. An occupancy used primarily for the storage or sheltering of goods, merchandise, products, vehicles, or animals. [***101,*** 2006]

3.3.36 Occupancy Classification. The system of defining the predominant operating characteristic of a portion of a building or plant for purposes of applying relevant sections of this code.

3.3.36.1 Outdoor Occupancy Classification. The system of defining the predominant operating characteristic of an outdoor operation that is not enclosed in a building or shelter for purposes of applying relevant sections of this code.

3.3.37* Operating Unit (Vessel) or Process Unit (Vessel). The equipment in which a unit operation or unit process is conducted. *(See also 3.3.49, Unit Operation or Unit Process.)*

3.3.38 Operations. A general term that includes, but is not limited to, the use, transfer, storage, and processing of liquids.

3.3.39* Pier. A structure, usually of greater length than width and projecting from the shore into a body of water with direct access from land, that can be either open deck or provided with a superstructure. [**307,** 2006]

3.3.40 Pressure Vessel. A container or other component designed in accordance with the ASME *Boiler and Pressure Vessel Code*. [**52,** 2006]

3.3.41* Process or Processing. An integrated sequence of operations.

3.3.42 Protection for Exposures. Fire protection for structures on property adjacent to liquid storage that is provided by (1) a public fire department or (2) a private fire brigade maintained on the property adjacent to the liquid storage, either of which is capable of providing cooling water streams to protect the property adjacent to the liquid storage.

3.3.43 Refinery. A plant in which flammable or combustible liquids are produced on a commercial scale from crude petroleum, natural gasoline, or other hydrocarbon sources.

3.3.44* Safety Can. A listed container of not more than 5.3 gal (20 L) capacity having a spring-closing lid and spout cover, and so designed that it will safely relieve internal pressure when subjected to fire exposure.

3.3.45 Solvent Distillation Unit. An appliance that distills a flammable or combustible liquid to remove contaminants and recover the liquid.

3.3.46 Staging. Temporary storage in a process area of liquids in containers, intermediate bulk containers, and portable tanks.

3.3.47 Tank.

3.3.47.1 Aboveground Tank. A storage tank that is installed above grade, at grade, or below grade without backfill.

3.3.47.1.1 Protected Aboveground Tank. An atmospheric aboveground storage tank with integral secondary containment and thermal insulation that has been evaluated for resistance to physical damage and for limiting the heat transferred to the primary tank when exposed to a hydrocarbon pool fire and is listed in accordance with ANSI/UL 2085, *Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids,* or an equivalent test procedure.

3.3.47.2* Atmospheric Tank. A storage tank that has been designed to operate at pressures from atmospheric through a gauge pressure of 1.0 psi (6.9 kPa) (i.e., 760 mm Hg through 812 mm Hg) measured at the top of the tank.

3.3.47.3 Fire-Resistant Tank. An atmospheric aboveground storage tank with thermal insulation that has been evaluated for resistance to physical damage and for limiting the heat transferred to the primary tank when exposed to a hydrocarbon pool fire and is listed in accordance with UL 2080, *Standard for Fire Resistant Tanks for Flammable and Combustible Liquids*, or an equivalent test procedure.

3.3.47.4 Low-Pressure Tank. For the purposes of this code, a storage tank designed to withstand an internal pressure above a gauge pressure of 1.0 psi (6.9 kPa) but not more than a gauge pressure of 15 psi (103 kPa) measured at the top of the tank.

3.3.47.5 Portable Tank. Any vessel having a liquid capacity over 60 gal (230 L) intended for storing liquids and not intended for fixed installation.

3.3.47.5.1* Nonmetallic Portable Tank. A portable tank, as herein defined, constructed of plastic, fiber, or a material other than metal.

3.3.47.6 Secondary Containment Tank. A tank that has an inner and outer wall with an interstitial space (annulus) between the walls and that has a means for monitoring the interstitial space for a leak.

3.3.47.7 Storage Tank. Any vessel having a liquid capacity that exceeds 60 gal (230 L), is intended for fixed installation, and is not used for processing.

3.3.48 Terminal. That portion of a property where liquids are received by tank vessel, pipelines, tank car, or tank vehicle and are stored or blended in bulk for the purpose of distributing such liquids by tank vessel, pipeline, tank car, tank vehicle, portable tank, or container.

3.3.49 Unit Operation or Unit Process. A segment of a physical or chemical process that might or might not be integrated with other segments to constitute the manufacturing sequence.

3.3.50 Vapor Pressure. The pressure, measured in pounds per square inch, absolute (psia), exerted by a liquid, as determined by ASTM D 323, *Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method).*

3.3.51 Vapor Processing Equipment. Those components of a vapor processing system designed to process vapors or liquids captured during transfer or filling operations.

3.3.52* Vapor Processing System. A system designed to capture and process vapors displaced during transfer or filling operations by use of mechanical or chemical means.

3.3.53* Vapor Recovery System. A system designed to capture and retain, without processing, vapors displaced during transfer or filling operations.

3.3.54 Vaportight. The ability of an enclosure or device to prevent the unintended release of flammable vapor at normal operating temperature and pressure ranges.

3.3.55 Vault. An enclosure consisting of four walls, a floor, and a top for the purpose of containing a liquid storage tank and not intended to be occupied by personnel other than for inspection, repair, or maintenance of the vault, the storage tank, or related equipment.

3.3.56 Vent.

3.3.56.1 Emergency Relief Vent. An opening, construction method, or device that will automatically relieve excessive internal pressure due to an exposure fire.

3.3.56.2 Normal Vent. An opening, construction method, or device that allows the relief of excessive internal pressure or vacuum during normal storage and operations.

3.3.57* Ventilation. For the purpose of this code, movement of air that is provided for the prevention of fire and explosion.

3.3.58* Warehouse.

3.3.58.1 General-Purpose Warehouse. A separate, detached building or portion of a building used only for warehousing-type operations and classified as a "storage — low hazard" or "storage — ordinary hazard" occupancy by the building code and by NFPA *101*, *Life Safety Code*.

3.3.58.2 Liquid Warehouse. A separate, detached building or an attached building that is used for warehousing-type operations for liquids and whose exterior wall comprises at least 25 percent of the building perimeter.

3.3.59* Wharf. A structure at the shoreline that has a platform built along and parallel to a body of water with either an open deck or a superstructure. [**307,** 2006]

Chapter 4 Definition and Classification of Liquids

4.1 Scope.

4.1.1 This chapter shall establish a uniform system of defining and classifying flammable and combustible liquids for the purpose of proper application of this code.

4.1.2 The definitions and classifications of this chapter shall apply to any liquid within the scope of and subject to the requirements of this code.

4.2 Definitions Specific to Chapter 4.

For the purposes of this chapter and this code, the terms in this section shall have the definitions given.

4.2.1* **Boiling Point.** The temperature at which the vapor pressure of a liquid equals the surrounding atmospheric pressure. For purposes of defining the boiling point, atmospheric pressure shall be considered to be an absolute pressure of 14.7 psi (101.4 kPa). For mixtures that do not have a constant boiling point, the 20 percent evaporated point of a distillation performed in accordance with ASTM D 86, *Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure,* shall be considered to be the boiling point.

4.2.2 Combustible Liquid. Any liquid that has a closed-cup flash point at or above 100°F (37.8°C), as determined by the test procedures and apparatus set forth in Section 4.4. Combustible liquids are classified according to Section 4.3.

4.2.3 Flammable Liquid. Any liquid that has a closed-cup flash point below 100°F (37.8°C), as determined by the test procedures and apparatus set forth in Section 4.4 and a Reid vapor pressure that does not exceed an absolute pressure of 40 psi (276 kPa) at 100°F (37.8°C), as determined by ASTM D 323, *Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method).* Flammable liquids are classified according to Section 4.3. *(See A.3.3.30.2.)*

4.2.4* Flash Point. The minimum temperature of a liquid at which sufficient vapor is given off to form an ignitible mixture with the air, near the surface of the liquid or within the vessel used, as determined by the appropriate test procedure and apparatus specified in Section 4.4.

4.2.5 Liquid. Any material that (1) has a fluidity greater than that of 300 penetration asphalt when tested in accordance with ASTM D 5, *Standard Test Method for Penetration of Bituminous Materials,* or (2) is a viscous substance for which a specific melting point cannot be determined but that is determined to be a liquid in accordance with ASTM D 4359, *Standard Test for Determining Whether a Material is a Liquid or a Solid.*

4.2.6* Vapor Pressure. The pressure, measured in pounds per square inch, absolute, exerted by a liquid, as determined by ASTM D 323, *Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method).*

4.3* Classification of Liquids.

Any liquid within the scope of this code and subject to the requirements of this code shall be classified in accordance with this section.

4.3.1 Flammable liquids, as defined in 3.3.30.2 and 4.2.3, shall be classified as Class I liquids and shall be further subclassified in accordance with the following:

(1) Class IA Liquid — Any liquid that has a flash point below 73°F (22.8°C) and a boiling point below 100°F (37.8°C)

(2) Class IB Liquid — Any liquid that has a flash point below 73°F (22.8°C) and a boiling point at or above 100°F (37.8°C)

(3) Class IC Liquid — Any liquid that has a flash point at or above 73°F (22.8°C), but below 100°F (37.8°C)

4.3.2 Combustible liquids, as defined in 3.3.30.1 and 4.2.2, shall be classified in accordance with the following:

(1) Class II Liquid — Any liquid that has a flash point at or above 100°F (37.8°C) and below 140°F (60°C)

(2) Class III Liquid — Any liquid that has a flash point at or above 140°F (60°C)

    (a) Class IIIA Liquid — Any liquid that has a flash point at or above 140°F (60°C), but below 200°F (93°C)

    (b) Class IIIB Liquid — Any liquid that has a flash point at or above 200°F (93°C)

4.4 Determination of Flash Point.

The flash point of a liquid shall be determined according to the methods specified in 4.4.1 through 4.4.4.

4.4.1 Except as specified in 4.4.1.1, the flash point of a liquid having a viscosity below 5.5 centiStokes at 104°F (40°C) or below 9.5 centiStokes at 77°F (25°C) shall be determined in accordance with ASTM D 56, *Standard Test Method for Flash Point by Tag Closed Cup Tester*.

4.4.1.1 Cut-back asphalts, liquids that tend to form a surface film, and liquids that contain suspended solids shall not be tested in accordance with ASTM D 56, even if they otherwise meet the viscosity criteria. Such liquids shall be tested in accordance with 4.4.2.

4.4.2 The flash point of a liquid having a viscosity of 5.5 centiStokes or more at 104°F (40°C) or 9.5 centiStokes or more at 77°F (25°C) or a flash point of 200°F (93.4°C) or higher shall be determined in accordance with ASTM D 93, *Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester*.

4.4.3 As an alternative, ASTM D 3278, *Standard Test Method for Flash Point of Liquids by Small Scale Closed Cup Apparatus*, shall be permitted to be used for paints, enamels, lacquers, varnishes, and related products and their components that have flash points between 32°F (0°C) and 230°F (110°C) and viscosities below 150 Stokes at 77°F (25°C).

4.4.4 As an alternative, ASTM D 3828, *Standard Test Methods for Flash Point by Small Scale Closed Cup Tester*, shall be permitted to be used for materials other than those for which ASTM D 3278 is specifically required.

4.5 Relationship to Other Classification Systems. (Reserved)

Chapter 5 General Requirements (Reserved)

5.1 Reserved.

Chapter 6 Fire Prevention and Fire Risk Control

6.1* Scope.

This chapter shall apply to the hazards associated with processing and handling of liquids. This chapter shall also apply when specifically referenced by another chapter.

6.2 Definitions Specific to Chapter 6.

(Reserved)

6.3* Management of Fire and Explosion Hazards.

This chapter shall apply to the management methodology used to identify, evaluate, and control the hazards involved in the processing and handling of flammable and combustible liquids. These hazards include, but are not limited to, preparation, separation, purification, and change of state, energy content, or composition.

6.4 Hazards Analysis.

6.4.1 General. Operations involving flammable and combustible liquids shall be reviewed to ensure that fire and explosion hazards resulting from loss of containment of liquids are provided with corresponding fire prevention, fire control, and emergency action plans.

Exception No. 1: Operations where liquids are used solely for on-site consumption as fuels.

Exception No. 2: Operations where Class II or Class III liquids are stored in atmospheric tanks or transferred at temperatures below their flash points.

Exception No. 3: Mercantile occupancies, crude petroleum exploration, drillings, and well servicing operations, and normally unoccupied facilities in remote locations.

6.4.1.1* The extent of fire prevention and control that is provided shall be determined in consultation with the authority having jurisdiction or by means of an engineering evaluation of the operation and application of sound fire protection and process engineering principles. This evaluation shall include, but not be limited to, the following:

(1) Analysis of the fire and explosion hazards of the operation

(2) Analysis of emergency relief from process vessels, taking into consideration the properties of the materials used and the fire protection and control measures taken

(3) Analysis of applicable facility design requirements in Chapters 17, 18, 19, 28, and 29

(4) Analysis of applicable requirements for liquid handling, transfer, and use, as covered in Chapters 17, 18, 19, 28, and 29

(5) Analysis of local conditions, such as exposure to and from adjacent properties and exposure to floods, earthquakes, and windstorms

(6) Analysis of the emergency response capabilities of the local emergency services

6.4.2 Management of Change. The hazards analysis shall be repeated whenever the hazards leading to a fire or explosion change significantly. Conditions that might require repeating a review shall include, but are not limited to, the following:

(1) When changes occur in the materials in process

(2) When changes occur in process equipment

(3) When changes occur in process control

(4) When changes occur in operating procedures or assignments

6.5 Control of Ignition Sources.

6.5.1 General. Precautions shall be taken to prevent the ignition of flammable vapors by sources such as the following:

(1) Open flames

(2) Lightning

(3) Hot surfaces

(4) Radiant heat

(5) Smoking

(6) Cutting and welding

(7) Spontaneous ignition

(8) Frictional heat or sparks

(9) Static electricity

(10) Electrical sparks

(11) Stray currents

(12) Ovens, furnaces, and heating equipment

6.5.2 Smoking. Smoking shall be permitted only in designated and identified areas.

6.5.3* Hot Work.

6.5.3.1 Welding, cutting, and similar spark-producing operations shall not be permitted in areas containing flammable liquids until a written permit authorizing such work has been issued.

6.5.3.2 The permit shall be issued by a person in authority following inspection of the area to ensure that permit requirements have been implemented and will be followed until the job is completed.

6.5.4* Static Electricity.

6.5.4.1 All equipment such as tanks, machinery, and piping shall be designed and operated to prevent electrostatic ignitions.

6.5.4.2 All metallic equipment such as tanks, machinery, and piping where the potential exists for an ignitible mixture to be present shall be bonded and grounded.

6.5.4.3 The bond and ground shall be physically applied or shall be inherently present by the nature of the installation.

6.5.4.4 Any electrically isolated section of metallic piping or equipment shall be bonded and grounded to prevent hazardous accumulation of static electricity.

6.5.4.5 All nonmetallic equipment and piping where the potential exists for an ignitable mixture to be present shall be designed and operated to prevent electrostatic ignition.

6.5.5 Electrical Systems. Design, selection, and installation of electrical wiring and electrical utilization equipment shall meet the requirements of Chapter 7.

6.6 Detection and Alarm Systems.

6.6.1* An approved means for prompt notification of fire or emergency to those within the plant and to the available public or mutual aid fire department shall be provided.

6.6.2 Those areas, including buildings, where a potential exists for a flammable liquid spill shall be monitored as appropriate. The following methods shall be permitted to be used:

(1) Personnel observation or patrol

(2) Process-monitoring equipment that would indicate a spill or leak could have occurred

(3) Provision of gas detectors to continuously monitor the area where facilities are unattended

6.7 Fire Protection and Fire Suppression Systems.

6.7.1* This section identifies recognized fire protection and fire suppression systems and methods used to prevent or minimize the loss from fire or explosion in liquid-processing facilities. The application of one or a combination of these systems and methods as well as the use of fire-resistive materials shall be determined in accordance with Sections 6.3 and 6.4.

6.7.2 A reliable water supply or other suitable fire control agent shall be available in pressure and quantity to meet the fire demands indicated by the specific hazards of liquids-processing operations, storage, or exposure.

6.7.3* Permanent connections between the fire water system and any process system shall be prohibited, to prevent contamination of fire water with process fluids.

6.7.4 Where required by this chapter, hydrants, with or without fixed monitor nozzles, shall be provided in accordance with NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*. The number and placement shall depend on the hazards of the facility.

6.7.5* Where the need is indicated by the hazards of liquid processing, storage, or exposure as determined by Section 6.4, fixed protection shall be provided.

6.7.6 Where provided, fire control systems shall be designed, installed, and maintained in accordance with the following NFPA standards, as applicable:

(1) NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*

(2) NFPA 12, *Standard on Carbon Dioxide Extinguishing Systems*

(3) NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems*

(4) NFPA 13, *Standard for the Installation of Sprinkler Systems*

(5) NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*

(6) NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*

(7) NFPA 17, *Standard for Dry Chemical Extinguishing Systems*

(8) NFPA 2001, *Standard on Clean Agent Fire Extinguishing Systems*

6.7.7 Where required by this chapter, standpipe and hose systems shall be installed in accordance with NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, or hose connections from sprinkler systems using combination spray and straight stream nozzles, shall be installed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*.

6.7.8* Where required by this chapter, listed portable fire extinguishers shall be provided in such quantities, sizes, and types as are needed for the specific hazards of operation and storage.

6.7.9 Where provided, mobile foam apparatus and supplies of foam concentrate shall be appropriate to the specific hazards.

6.8 Emergency Planning and Training.

6.8.1 A written emergency action plan that is consistent with available equipment and personnel shall be established to respond to fires and related emergencies. This plan shall include the following:

(1) Procedures to be followed in case of fire, such as sounding the alarm, notifying the fire department, evacuating personnel, and controlling and extinguishing the fire

(2) Procedures and schedules for conducting drills of these procedures

(3) Appointment and training of personnel to carry out assigned duties, including review at the time of initial assignment, as responsibilities or response actions change, and whenever anticipated duties change

(4) Maintenance of fire protection equipment

(5) Procedures for shutting down or isolating equipment to reduce the release of liquid, including assigning personnel responsible for maintaining critical plant functions or shutdown of plant processes

(6) Alternate measures for the safety of occupants

6.8.2 Personnel responsible for the use and operation of fire protection equipment shall be trained in the use of that equipment. Refresher training shall be conducted at least annually.

6.8.3 Planning of effective fire control measures shall be coordinated with local emergency response agencies.

6.8.4 Procedures shall be established to provide for safe shutdown of operations under emergency conditions. Provisions shall be made for training of shutdown procedures and use of associated alarms, interlocks, and controls. Provisions shall also be made for inspection and testing of associated alarms, interlocks, and controls.

6.8.5 The emergency procedures shall be kept readily available in the operating areas and shall be updated when conditions change, as identified in 6.4.2.

6.8.5.1 Where premises are likely to be unattended for considerable periods of time, a summary of the emergency plan shall be posted or located in a strategic and accessible location.

6.9 Inspection and Maintenance.

6.9.1 All fire protection equipment shall be properly maintained, and periodic inspections and tests shall be done in accordance with both standard practice and the equipment manufacturer's recommendations. Water-based fire protection systems shall be inspected, tested, and maintained in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

6.9.2 Maintenance and operating practices shall control leakage and prevent spillage of flammable liquids.

6.9.3 Combustible waste material and residues in operating areas shall be kept to a minimum, stored in covered metal containers, and disposed of daily.

6.9.4 Ground areas around facilities where liquids are stored, handled, or used shall be kept free of weeds, trash, or other unnecessary combustible materials.

6.9.5 Aisles established for movement of personnel shall be kept clear of obstructions to permit orderly evacuation and ready access for manual fire-fighting activities.

6.10 Management of Security. (Reserved)

Chapter 7 Electrical Systems

7.1 Scope.

This chapter shall apply to areas where Class I liquids are stored or handled and to areas where Class II or Class III liquids are stored or handled at or above their flash points.

7.2 Definitions Specific to Chapter 7. (Reserved)

7.3 General Requirements.

7.3.1 Electrical utilization equipment and wiring shall not constitute a source of ignition for any ignitible vapor that might be present under normal operation or because of a spill. Compliance with 7.3.2 through 7.3.7.1 shall be deemed as meeting the requirements of this section.

7.3.2 All electrical utilization equipment and wiring shall be of a type specified by and installed in accordance with NFPA 70, *National Electrical Code*.

7.3.3* Table 7.3.3 shall be used to delineate and classify areas for the purpose of installation of electrical utilization equipment and wiring under normal operating conditions.

Table 7.3.3 Electrical Area Classifications

Location	*NEC* Class I Division	*NEC* Class I Zone	Extent of Classified Area
Indoor equipment installed in accordance with Section 7.3 where flammable vapor–air mixtures can exist under normal operation	1	0	The entire area associated with such equipment where flammable gases or vapors are present continuously or for long periods of time
	1	1	Area within 5 ft of any edge of such equipment, extending in all directions

Table 7.3.3 Electrical Area Classifications

Location	*NEC* Class I Division	*NEC* Class I Zone	Extent of Classified Area
	2	2	Area between 5 ft and 8 ft of any edge of such equipment, extending in all directions; also, space up to 3 ft above floor or grade level within 5 ft to 25 ft horizontally from any edge of such equipment[1]
Outdoor equipment of the type covered in Section 7.3 where flammable vapor–air mixtures can exist under normal operation	1	0	The entire area associated with such equipment where flammable gases or vapors are present continuously or for long periods of time
	1	1	Area within 3 ft of any edge of such equipment, extending in all directions
	2	2	Area between 3 ft and 8 ft of any edge of such equipment, extending in all directions; also, space up to 3 ft above floor or grade level within 3 ft to 10 ft horizontally from any edge of such equipment
Tank storage installations inside buildings	1	1	All equipment located below grade level
	2	2	Any equipment located at or above grade level
Tank — aboveground, fixed roof	1	0	Inside fixed-roof tank
	1	1	Area inside dike where dike height is greater than the distance from the tank to the dike for more than 50 percent of the tank circumference
	2	2	Within 10 ft from shell, ends, or roof of tank; also, area inside dike up to top of dike wall
	1	0	Area inside of vent piping or vent opening
	1	1	Within 5 ft of open end of vent, extending in all directions
	2	2	Area between 5 ft and 10 ft from open end of vent, extending in all directions
Tank — aboveground, floating roof			
With fixed outer roof	1	0	Area between the floating and fixed-roof sections and within the shell
With no fixed outer roof	1	1	Area above the floating roof and within the shell
Tank vault — interior	1	1	Entire interior volume, if Class I liquids are stored within
Underground tank fill opening	1	1	Any pit, box, or space below grade level, if any part is within a Division 1 or 2 or Zone 1 or 2 classified location
	2	2	Up to 18 in. above grade level within a horizontal radius of 10 ft from a loose fill connection and within a horizontal radius of 5 ft from a tight fill connection
Vent — discharging upward	1	0	Area inside of vent piping or opening
	1	1	Within 3 ft of open end of vent, extending in all directions
	2	2	Area between 3 ft and 5 ft of open end of vent, extending in all directions

Table 7.3.3 Electrical Area Classifications

Location	*NEC* Class I Division	*NEC* Class I Zone	Extent of Classified Area
Drum and container filling — outdoors or indoors	1	0	Area inside the drum or container
	1	1	Within 3 ft of vent and fill openings, extending in all directions
	2	2	Area between 3 ft and 5 ft from vent or fill opening, extending in all directions; also, up to 18 in. above floor or grade level within a horizontal radius of 10 ft from vent or fill opening
Pumps, bleeders, withdrawal fittings			
Indoor	2	2	Within 5 ft of any edge of such devices, extending in all directions; also, up to 3 ft above floor or grade level within 25 ft horizontally from any edge of such devices
Outdoor	2	2	Within 3 ft of any edge of such devices, extending in all directions; also, up to 18 in. above grade level within 10 ft horizontally from any edge of such devices
Pits and sumps			
Without mechanical ventilation	1	1	Entire area within a pit or sump if any part is within a Division 1 or 2 or Zone 1 or 2 classified location
With adequate mechanical ventilation	2	2	Entire area within a pit or sump if any part is within a Division 1 or 2 or Zone 1 or 2 classified location
Containing valves, fittings, or piping, and not within a Division 1 or 2 or Zone 1 or 2 classified location	2	2	Entire pit or sump
Drainage ditches, separators, impounding basins			
Outdoor	2	2	Area up to 18 in. above ditch, separator, or basin; also, area up to 18 in. above grade within 15 ft horizontally from any edge
Indoor			Same as pits and sumps
Tank vehicle and tank car[2]			
Loading through open dome	1	0	Area inside of the tank
	1	1	Within 3 ft of edge of dome, extending in all directions
	2	2	Area between 3 ft and 15 ft from edge of dome, extending in all directions
Loading through bottom connections with atmospheric venting	1	0	Area inside of the tank
	1	1	Within 3 ft of point of venting to atmosphere, extending in all directions
	2	2	Area between 3 ft and 15 ft from point of venting to atmosphere, extending in all directions; also, up to 18 in. above grade within a horizontal radius of 10 ft from point of loading connection

Table 7.3.3 Electrical Area Classifications

Location	*NEC* Class I Division	*NEC* Class I Zone	Extent of Classified Area
Loading through closed dome with atmospheric venting	1	1	Within 3 ft of open end of vent, extending in all directions
	2	2	Area between 3 ft and 15 ft from open end of vent, extending in all directions; also, within 3 ft of edge of dome, extending in all directions
Loading through closed dome with vapor control	2	2	Within 3 ft of point of connection of both fill and vapor lines, extending in all directions
Bottom loading with vapor control or any bottom unloading	2	2	Within 3 ft of point of connections, extending in all directions; also, up to 18 in. above grade within a horizontal radius of 10 ft from point of connections
Storage and repair garage for tank vehicles	1	1	All pits or spaces below floor level
	2	2	Area up to 18 in. above floor or grade level for entire storage or repair garage
Garages for other than tank vehicles	Ordinary		If there is any opening to these rooms within the extent of an outdoor classified location, the entire room shall be classified the same as the area classification at the point of the opening
Outdoor drum storage	Ordinary		
Inside rooms or storage lockers used for the storage of Class I liquids	2	2	Entire room or locker
Indoor warehousing where there is no flammable liquid transfer	Ordinary		If there is any opening to these rooms within the extent of an indoor classified location, the classified location shall extend through the opening to the same extent as if the wall, curb, or partition did not exist
Office and rest rooms	Ordinary		If there is any opening to these rooms within the extent of an indoor classified location, the room shall be classified the same as if the wall, curb, or partition did not exist
Piers and wharves	See Figure 29.3.22.		

For SI units, 1 in. = 25 mm; 1 ft = 0.3 m.

[1]The release of Class I liquids can generate vapors to the extent that the entire building, and possibly an area surrounding it, should be considered a Class I, Division 2, or Zone 2 location.

[2]When classifying extent of area, consideration should be given to the fact that tank cars or tank vehicles can be spotted at varying points. Therefore, the extremities of the loading or unloading positions should be used.

7.3.4 A classified area shall not extend beyond a floor, wall, roof, or other solid partition that has no openings within the classified area.

7.3.5 The designation of classes, divisions, and zones shall be as defined in Chapter 5 of NFPA 70, *National Electrical Code*.

7.3.6 The area classifications listed in Table 7.3.3 are based on the premise that all applicable requirements of this code have been met. If this is not the case, the authority having jurisdiction shall have the authority to classify the extent of the area.

7.3.7* Where the provisions of 7.3.1 through 7.3.6 require the installation of electrical equipment suitable for Class I, Division 1 or 2, or Zone 1 or 2 locations, ordinary electrical equipment, including switchgear, shall be permitted to be used if installed in a room or enclosure that is maintained under positive pressure with respect to the classified area.

7.3.7.1 Ventilation make-up air shall be taken from an uncontaminated source.

7.4 Application of Area Classification. (Reserved)

Chapter 8 Reserved

Chapter 9 Storage of Liquids in Containers — General Requirements

9.1 Scope.

9.1.1 This chapter shall apply to the storage of flammable and combustible liquids, hereinafter referred to as "liquids," in:

(1) Drums or other containers that do not exceed 119 gal (450 L) individual capacity

(2) Portable tanks that do not exceed 660 gal (2500 L) individual capacity

(3) Intermediate bulk containers that do not exceed 793 gal (3000 L)

9.1.2 This chapter shall also apply to limited transfer of liquids incidental thereto.

9.1.3 This chapter shall also apply to overpack drums when used for temporary containment of containers that do not exceed 60 gal (230 L) capacity. Such overpack containers shall be treated as containers as defined in 3.3.10.

9.1.4 This chapter shall not apply to the following:

(1) Containers, intermediate bulk containers, and portable tanks that are used in operations areas, as covered by Chapter 17

(2) Liquids in the fuel tanks of motor vehicles, aircraft, boats, or portable or stationary engines

(3) Beverages where packaged in individual containers that do not exceed 1.3 gal (5 L) capacity

(4) Medicines, foodstuffs, cosmetics, and other consumer products that contain not more than 50 percent by volume of water-miscible flammable or combustible liquids, with the remainder of the product consisting of components that do not burn and where packaged in individual containers that do not exceed 1.3 gal (5 L) capacity

(5) Liquids that have no fire point when tested in accordance with ASTM D 92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup*, up to the boiling point of the liquid or up to a temperature at which

the liquid shows an obvious physical change

(6) Liquids with a flash point greater than 95°F (35°C) in a water-miscible solution or water-miscible dispersion with a water and noncombustible solids content of more than 80 percent by weight, and which does not sustain combustion when tested in accordance with "Method of Testing for Sustained Combustibility," in accordance with Title 49, Code of Federal Regulations, Part 173, Appendix H, or the UN publication*Recommendations on the Transport of Dangerous Goods*

(7) Distilled spirits and wines in wooden barrels or casks

9.2 Definitions Specific to Chapter 9.

(Reserved)

9.3 General Requirements.

9.3.1 The general requirements of this chapter shall be applicable to the storage of liquids in liquid storage areas as covered in Chapters 10 through 14, regardless of the quantities being stored.

Exception: Where more stringent requirements are set forth in Chapters 10 through 14, those requirements shall take precedence.

9.3.2 For the purposes of Chapters 9 through 16, unstable liquids shall be treated as Class IA liquids.

9.3.3 Means of egress shall meet applicable requirements of NFPA *101*, *Life Safety Code*.

9.3.3.1 Storage of liquids shall not physically obstruct a means of egress.

9.3.4 For the purposes of this chapter and Chapters 10, 12, and 16, *protected storage* shall mean storage installed after January 1, 1997 that is protected in accordance with Chapter 16. All other storage shall be considered to be unprotected storage unless an alternate means of protection has been approved by the authority having jurisdiction. *(See 16.3.6 and Section 16.9.)*

9.3.5 Wood of at least 1 in. (25 mm) nominal thickness shall be permitted to be used for shelving, racks, dunnage, scuffboards, floor overlay, and similar installations.

9.3.6 Class I liquids shall not be permitted to be stored in basements as defined in 3.3.3.

9.3.7 Class II and Class IIIA liquids shall be permitted to be stored in basements as defined in 3.3.3, provided the basement is protected in accordance with Chapter 16.

9.3.8 Class IIIB liquids shall be permitted to be stored in basements as defined in 3.3.3.

9.3.9 Limited quantities of combustible commodities, as defined in NFPA 13, *Standard for the Installation of Sprinkler Systems*, shall be permitted to be stored in liquid storage areas if the ordinary combustibles, other than those used for packaging the liquids, are separated from the liquids in storage by a minimum of 8 ft (2.4 m) horizontally, either by aisles or by open racks, and if protection is provided in accordance with Chapter 16.

9.3.10 Where containers, intermediate bulk containers, or portable tanks are stacked, they shall be stacked so that stability is maintained and excessive stress on container walls is prevented.

9.3.10.1 Portable tanks and intermediate bulk containers stored more than one high shall be designed to stack securely, without the use of dunnage.

9.3.10.2 Materials-handling equipment shall be capable of handling containers, portable tanks, and intermediate bulk containers that are stored at all storage levels.

9.3.10.3* Power-operated industrial trucks used to move Class I liquids shall be selected, operated, and maintained in accordance with NFPA 505, *Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations*.

9.3.11 Containers, intermediate bulk containers, and portable tanks in unprotected liquid storage areas shall not be stored closer than 36 in. (915 mm) to the nearest beam, chord, girder, or other roof member.

9.3.12 Liquids used for building maintenance, painting, or other similar infrequent maintenance purposes shall be permitted to be stored in closed containers outside of storage cabinets or inside liquid storage areas, if limited to an amount that does not exceed a 10-day supply at anticipated rates of use.

9.4 Acceptable Containers.

9.4.1* Only the following approved containers, intermediate bulk containers, and portable tanks shall be used for Class I, Class II, and Class IIIA liquids:

(1) Metal containers, metal intermediate bulk containers, and metal portable tanks meeting the requirements of and containing products authorized by the U.S. Department of Transportation Hazardous Materials Regulations in Title 49, Code of Federal Regulations, Parts 100–199, or by Part 6 of the UN *Recommendations on the Transport of Dangerous Goods*

(2) Plastic or metal containers meeting the requirements of and used for petroleum products within the scope of one or more of the following specifications:

  (a) ASTM F 852, *Standard Specification for Portable Gasoline Containers for Consumer Use*

  (b) ASTM F 976, *Standard Specification for Portable Kerosine and Diesel Containers for Consumer Use*

  (c) ANSI/UL 1313, *Standard for Nonmetallic Safety Cans for Petroleum Products*

  (d) ANSI/UL 30, *Standard for Metal Safety Cans*

  (e) ANSI/UL 1314, *Standard for Special Purpose Metal Containers*

  (f) FM Global *Approval Standard for Safety Containers and Filling, Supply, and Disposal Containers* — Class Number 6051 and 6052

(3) Plastic containers that meet requirements set by and contain products authorized by the following:

  (a) The U. S. Department of Transportation Hazardous Materials Regulations in Title 49, Code of Federal Regulations, Parts 100–199, or by Part 6 of the UN publication *Recommendations on the Transport of Dangerous Goods*

  (b) Items 256 or 258 of the *National Motor Freight Classification* (NMFC) for liquids that are not classified as hazardous by the U.S. Department of Transportation Hazardous Materials Regulations in Title 49, Code of Federal Regulations, Parts 100–199, or by Part 6 of the UN publication *Recommendations on the Transport of Dangerous Goods*

(4) Fiber drums that meet the following:

(a) Requirements of Items 294 and 296 of the *National Motor Freight Classification* (NMFC), or Rule 51 of the *Uniform Freight Classification* (UFC), for Types 2A, 3A, 3B-H, 3B-L, or 4A

(b) Requirements of, and containing liquid products authorized by, either the U.S. Department of Transportation Hazardous Materials Regulations in Title 49, Code of Federal Regulations, Chapter I, or by U.S. Department of Transportation exemption

(5)* Rigid nonmetallic intermediate bulk containers that meet requirements set by and contain products authorized by the following:

(a) The U.S. Department of Transportation Hazardous Materials Regulations in Title 49, Code of Federal Regulations, Parts 100–199, or by Part 6 of the UN publication *Recommendations on the Transport of Dangerous Goods*, for Classes 31H1, 31H2, and 31HZ1

(b) The *National Motor Freight Classification* (NMFC), or the International Safe Transit Association for liquids that are not classified as hazardous by the U.S. Department of Transportation Hazardous Materials Regulations in Title 49, Code of Federal Regulations, Parts 100–199, or by Part 6 of the UN publication *Recommendations on the Transport of Dangerous Goods*

(6) Glass containers up to the capacity limits stated in Table 9.4.3 and in accordance with U.S. Department of Transportation Hazardous Materials Regulations in Title 49, Code of Federal Regulations, Parts 100–199

9.4.1.1 For protected storage, rigid nonmetallic intermediate bulk containers, as described in 9.4.1(5), shall be subjected to a standard fire test that demonstrates acceptable inside storage fire performance and shall be listed and labeled.

9.4.1.2 Medicines, beverages, foodstuffs, cosmetics, and other common consumer products, where packaged according to commonly accepted practices for retail sales, shall be exempt from the requirements of 9.4.1 and 9.4.3.

9.4.2 Each portable tank or intermediate bulk container shall be provided with one or more devices installed in the top with sufficient emergency venting capacity to limit internal pressure under fire exposure conditions to a gauge pressure of 10 psi (70 kPa) or 30 percent of the bursting pressure of the portable tank, whichever is greater.

9.4.2.1 The total venting capacity shall be not less than that specified in 22.7.3.2 or 22.7.3.4.

9.4.2.2 At least one pressure-actuated vent having a minimum capacity of 6000 ft^3 (170 m^3) of free air per hour at an absolute pressure of 14.7 psi (101 kPa) and 60°F (15.6°C) shall be used. It shall be set to open at not less than a gauge pressure of 5 psi (35 kPa).

9.4.2.3 If fusible vents are used, they shall be actuated by elements that operate at a temperature not exceeding 300°F (150°C). Where plugging of a pressure-actuated vent can occur, such as when used for paints, drying oils, and similar materials, fusible plugs or venting devices that soften to failure at a maximum of 300°F (150°C) under fire exposure shall be permitted to be used for the entire emergency venting requirement.

9.4.3 The maximum allowable size of a container, intermediate bulk container, or metal portable tank for Class I, Class II, and Class IIIA liquids shall not exceed that specified in Table 9.4.3.

Exception: As provided for in Section 9.1, 9.4.3.1, 9.4.3.2, and 9.4.3.3.

Table 9.4.3 Maximum Allowable Size — Containers, Intermediate Bulk Containers (IBCs), and Portable Tanks

Container Type	Flammable Liquids			Combustible Liquids	
	Class IA	**Class IB**	**Class IC**	**Class II**	**Class IIIA**
Glass	1 pt (0.5 L)	1 qt (1 L)	1.3 gal (5 L)	1.3 gal (5 L)	5.3 gal (20 L)
Metal (other than drums) or approved plastic	1.3 gal (5 L)	5.3 gal (20 L)	5.3 gal (20 L)	5.3 gal (20 L)	5.3 gal (20 L)
Safety cans	2.6 gal (10 L)	5.3 gal (20 L)	5.3 gal (20 L)	5.3 gal (20 L)	5.3 gal (20 L)
Metal drum (e.g., UN 1A1/1A2)	119 gal (450 L)	119 gal (450 L)	119 gal (450 L)	119 gal (450 L)	119 gal (450 L)
Approved metal portable tanks and IBCs	793 gal (3000 L)	793 gal (3000 L)	793 gal (3000 L)	793 gal (3000 L)	793 gal (3000 L)
Rigid plastic IBCs (UN 31H1 or 31H2) and composite IBCs with rigid inner receptacle (UN31HZ1)	NP	NP	NP	793 gal (3000 L)	793 gal (3000 L)
Composite IBCs with flexible inner receptacle (UN31HZ2) and DOT/UN-approved flexible IBCs	NP	NP	NP	NP	NP
Non-bulk Bag-in-Box	NP	NP	NP	NP	NP
Polyethylene UN1H1 and UN1H2, or as authorized by DOT exemption	1.3 gal (5 L)	5.3 gal (20 L)*	5.3 gal (20 L)*	119 gal (450 L)	119 gal (450 L)
Fiber drum NMFC or UFC Type 2A; Types 3A, 3B-H, or 3B-L; or Type 4A	NP	NP	NP	119 gal (450 L)	119 gal (450 L)

NP: Not permitted for the container categories so classified unless a fire protection system is provided that is developed in accordance with 16.3.6 and is approved for the specific container and protection against static electricity is provided.
*See 9.4.3.1.

9.4.3.1 Class IB and Class IC water-miscible liquids shall be permitted to be stored in plastic containers up to 60 gal (230 L) in size, if stored and protected in accordance with 16.5.2.7.

9.4.3.2 Class IA and Class IB liquids shall be permitted to be stored in glass containers of not more than 1.3 gal (5 L) capacity if the required liquid purity (such as American Chemical Society analytical reagent grade or higher) would be affected by storage in metal containers or if the liquid can cause excessive corrosion of a metal container.

9.4.3.3 Leaking or damaged containers up to 60 gal (230 L) capacity shall be permitted to be stored temporarily in accordance with this chapter and Chapters 10 through 12, provided they are enclosed in overpack containers.

9.4.3.3.1 To be considered protected storage as defined in 9.3.4 and in accordance with Chapter 16, an overpack container shall be constructed of the same material as the leaking or damaged container.

9.4.3.3.2 Metal overpack containers shall be considered nonrelieving style containers.

9.5* Flammable Liquids Storage Cabinets.

9.5.1 The volume of Class I, Class II, and Class IIIA liquids stored in an individual storage cabinet shall not exceed 120 gal (460 L).

9.5.2 The total aggregate volume of Class I, Class II, and Class IIIA liquids in a group of storage cabinets shall not exceed the maximum allowable quantity of flammable and combustible liquids per control area based on the occupancy where the cabinets are located.

9.5.3 Storage cabinets that meet at least one of the following sets of requirements shall be acceptable for storage of liquids:

(1) Storage cabinets designed and constructed to limit the internal temperature at the center of the cabinet and 1 in. (25 mm) from the top of the cabinet to not more than 325°F (163°C), when subjected to a 10-minute fire test that simulates the fire exposure of the standard time–temperature curve specified in NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials*, shall be acceptable. All joints and seams shall remain tight and the door shall remain securely closed during the test.

(2) Metal storage cabinets constructed in the following manner shall be acceptable:

  (a) The bottom, top, door, and sides of the cabinet shall be at least No. 18 gauge sheet steel and shall be double-walled, with 1½ in. (38 mm) air space.

  (b) Joints shall be riveted, welded, or made tight by some equally effective means.

  (c) The door shall be provided with a three-point latch arrangement, and the door sill shall be raised at least 2 in. (50 mm) above the bottom of the cabinet to retain spilled liquid within the cabinet.

(3) Wooden cabinets constructed in the following manner shall be acceptable:

  (a) The bottom, sides, and top shall be constructed of exterior grade plywood that is at least 1 in. (25 mm) thick and of a type that will not break down or delaminate under fire conditions.

  (b) All joints shall be rabbetted and shall be fastened in two directions with wood screws.

  (c) Where more than one door is used, there shall be a rabbetted overlap of not less than 1 in. (25 mm).

  (d) Doors shall be equipped with a means of latching, and hinges shall be constructed and mounted in such a manner as to not lose their holding capacity when subjected to fire exposure.

  (e) A raised sill or pan capable of containing a 2 in. (50 mm) depth of liquid shall be provided at the bottom of the cabinet to retain spilled liquid within the cabinet.

(4) Listed storage cabinets that have been constructed and tested in accordance with 9.5.3(1) shall be acceptable.

9.5.4* Storage cabinets shall not be required by this code to be ventilated for fire protection purposes.

9.5.4.1 If not ventilated, storage cabinet vent openings shall be sealed with the bungs supplied with the cabinet or with bungs specified by the cabinet manufacturer.

9.5.4.2 If ventilated for any reason, the storage cabinet vent openings shall be ducted directly to outdoors in such a manner that will not compromise the specified performance of the cabinet and in a manner that is acceptable to the authority having jurisdiction.

9.5.5 Storage cabinets shall be marked in lettering that is at least 2 in. (50 mm) high as follows:

WARNING: *FLAMMABLE — KEEP FIRE AWAY.*

9.6 Maximum Allowable Quantities (MAQs) per Control Area.

9.6.1 General Occupancy Limits. The MAQs of liquids allowed in each control area shall not exceed the amounts specified in Table 9.6.1.

Exception: As modified by 9.6.2 and Chapters 10 through 14.

Table 9.6.1 MAQ of Flammable and Combustible Liquids per Control Area

		Quantity		
	Liquid Class(es)	**gal**	**L**	**Notes**
Flammable liquids	IA	30	115	1, 2
	IB and IC	120	460	1, 2
	IA, IB, IC combined	120	460	1, 2, 3
Combustible liquids	II	120	460	1, 2
	IIIA	330	1,265	1, 2
	IIIB	13,200	50,600	1, 4

(Source: Table 34.1.3.1 of NFPA 5000, 2006 edition.)

Notes:

(1) Quantities are permitted to be increased 100 percent where stored in approved flammable liquids storage cabinets or in safety cans in accordance with the fire code. Where Note 2 also applies, the increase for both notes is permitted to be applied accumulatively.

(2) Quantities are permitted to be increased 100 percent in buildings equipped throughout with an automatic sprinkler system installed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*. Where Note 1 also applies, the increase for both notes is permitted to be applied accumulatively.

(3) Containing not more than the maximum allowable quantity per control area of Class IA, Class IB, or Class IC flammable liquids, individually.

(4) Quantities are not limited in a building equipped throughout with an automatic sprinkler system installed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*

9.6.2 Special Occupancy Limits.

9.6.2.1 For the following occupancies, the MAQs per control area shall not exceed the amounts specified in Table 9.6.2.1:

(1) Assembly

(2) Ambulatory health care

(3) Business

(4) Day care

(5) Detention and correctional

(6) Educational

(7) Health care

(8) Residential

Table 9.6.2.1 MAQs — Special Occupancy Limits

Liquid Class(es)	Quantity	
	gal	L
I and II	10	38
IIIA	60	227
IIIB	120	454

9.6.2.2 For the occupancies specified in 9.6.2.1, storage in excess of 10 gal (38 L) of Class I and Class II liquids combined or in excess of 60 gal (227 L) of Class IIIA liquids shall be permitted where stored in flammable liquids storage cabinets and where the total aggregate quantity does not exceed 180 gal (680 L).

9.6.2.3 Fuel in the tanks of operating mobile equipment shall be permitted to exceed the quantities specified in Table 9.6.1, where the equipment is operated in accordance with the fire code.

9.6.2.4 For ambulatory health care, day care, educational, and health care occupancies, the MAQ for Class IIIB liquids shall not be limited if the building is protected throughout with an automatic sprinkler system installed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*.

9.7 Control Areas.

9.7.1 For the purpose of this code, a control area shall be a space within a building where quantities of liquids that do not exceed the maximum quantities allowed by Table 9.6.1 or Table 9.6.2.1 are stored. [***5000:***34.2.4]

9.7.2 Control areas shall be separated from each other by fire barriers in accordance with Table 9.7.2.[***5000***:34.2.4.1.1]

Table 9.7.2 Design and Number of Control Areas [*5000:* Table 34.2.4.1.1]

Floor Level	Maximum Allowable Quantity per Control Area (percent)*	Number of Control Areas per Floor	Fire Resistance Rating for Fire Barriers(hr)†
Above grade			
>9	5	1	2
7–9	5	2	2
4–6	12.5	2	2
3	50	2	1
2	75	3	1
1	100	4	1

Table 9.7.2 Design and Number of Control Areas [*5000:* Table 34.2.4.1.1]

Floor Level	Maximum Allowable Quantity per Control Area (percent)*	Number of Control Areas per Floor	Fire Resistance Rating for Fire Barriers(hr)†
Below grade			
1	75	3	1
2	50	2	1
Lower than 2	NA	NA	NA

NA: Not allowed.

*Percentages represent the maximum allowable quantities per control area shown in Table 9.6.1, with all of the increases permitted in the footnotes of that table.

†Fire barriers are required to include floors and walls, as necessary, to provide a complete separation from other control areas.

9.7.3 Control areas located below grade that are considered basements, as defined in 3.3.3, shall not be utilized for the storage of Class I liquids.

9.8 Classification of Occupancies That Exceed the MAQs of Liquids per Control Area.

9.8.1* Occupancy Classifications. Buildings and portions of buildings where liquids are stored shall be classified as Protection Level 2 or Protection Level 3, as established in this section, when the MAQs per control area are exceeded.

9.8.1.1 Protection Level 2. Buildings and portions thereof storing quantities of liquids that are considered as High-Hazard Level 2 liquids and that exceed the maximum allowable quantities per control area shall be classified as Protection Level 2 occupancies.

9.8.1.2 Protection Level 3. Buildings and portions thereof storing quantities of liquids that are considered as High-Hazard Level 3 liquids and that exceed the maximum allowable quantities per control area shall be classified as Protection Level 3 occupancies.

9.8.2* Requirements for Specific Occupancies. Liquids stored in Protection Level 2 or Protection Level 3 occupancies shall meet the applicable requirements for storage in a Liquid Storage Room or Liquid Warehouse as defined in this code and in *NFPA 5000, Building Construction and Safety Code*.

9.9 Construction Requirements.

9.9.1 Storage areas shall be constructed to meet the fire resistance ratings specified in Table 9.9.1. Construction assemblies shall comply with the test specifications given in NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials*.

Table 9.9.1 Fire Resistance Ratings for Liquid Storage Areas

Type of Storage Area	Fire Resistance Rating (hr)		
	Interior Walls[a], Ceilings, Intermediate Floors	Roofs	Exterior Walls

Table 9.9.1 Fire Resistance Ratings for Liquid Storage Areas

Type of Storage Area	Fire Resistance Rating (hr): Interior Walls[a], Ceilings, Intermediate Floors	Roofs	Exterior Walls
Liquid storage room			
Floor area ≤ 150 ft^2	1	—	—
Floor area > 150 ft^2, but ≤ 500 ft^2	2	—	—
Liquid warehouse[b,c]	4[d]	—	2[e], 4[f]

For SI units, 1 ft^2 = 0.09 m^2 .

[a]Between liquid storage areas and any adjacent areas not dedicated to liquid storage.

[b]Fire resistance ratings for liquid warehouses storing only Class IIIB liquids, which are not heated above their flash point, are permitted to be reduced to 2 hours.

[c]Fire resistance ratings for liquid warehouses protected in accordance with Chapter 16 are permitted to be reduced to 2 hours.

[d]This should be a fire wall as defined in NFPA 221, *Standard for Fire Walls and Fire Barrier Walls*.

[e]For exposing walls that are located more than 10 ft (3 m) but less than 50 ft (15 m) from an important building or line of adjoining property that can be built upon.

[f]For exposing walls that are located 10 ft (3 m) or less from an important building or line of adjoining property that can be built upon.

9.9.2 Openings in interior walls to adjacent rooms or buildings and openings in exterior walls with fire resistance ratings shall be provided with normally closed, listed fire doors with fire protection ratings that correspond to the fire resistance rating of the wall as specified in Table 9.9.2.

Table 9.9.2 Protection Ratings for Fire Doors

Fire Resistance Rating of Wall as Required by Table 9.9.1 (hr)	Fire Protection Rating of Door (hr)
1	¾
2	1½
4	3*

*One fire door required on each side of interior openings for attached liquid warehouses.

9.9.2.1 Such doors shall be permitted to be arranged to stay open during material-handling operations if the doors are designed to close automatically in a fire emergency by provision of listed closure devices.

9.9.2.2 Fire doors shall be installed in accordance with NFPA 80, *Standard for Fire Doors and Other Opening Protectives*.

9.9.3 Exterior walls shall be constructed to provide ready access for fire-fighting operations by means of access openings, windows, or lightweight, noncombustible wall panels.

Exception: This requirement does not apply to liquid storage rooms totally enclosed within a building.

9.10 Fire Protection.

9.10.1 Protected Storage. Fire protection requirements for protected storage shall meet the requirements of 9.10.2 and Chapter 16.

9.10.2 Manual Fire Protection.

9.10.2.1 Portable fire extinguishers shall be provided in accordance with NFPA 10, *Standard for Portable Fire Extinguishers*, and this code.

9.10.2.2 Portable fire extinguishers shall meet the following requirements:

(1) At least one portable fire extinguisher having a capability of not less than 40:B shall be located outside of, but not more than 10 ft (3 m) from, the door opening into a liquid storage area.

(2) At least one portable fire extinguisher having a capability of not less than 40:B shall be located within 30 ft (9 m) of any Class I or Class II liquids located outside of a liquid storage area.

Exception: An acceptable alternative is at least one portable fire extinguisher having a capacity of 80:B located within 50 ft (15 m) of such a storage area.

9.10.2.3 Hose connections supplied from sprinkler systems shall be installed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*.

9.10.2.4 Hose connections supplied by a standpipe system shall be installed in accordance with NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*.

9.10.2.5 Hose connections shall also meet the following requirements:

(1) Hose connections shall be provided in protected general-purpose warehouses and in protected liquid warehouses.

(2) Where preconnected hose is provided, it shall be either 1½ in. (38 mm) lined fire hose or 1 in. (25 mm) hard rubber hose, using combination spray and straight stream nozzles.

9.10.2.6 The water supply shall be sufficient to meet the fixed fire protection demand plus a total of at least 500 gpm (1900 L/min) for inside and outside hose connections for at least 2 hours, unless otherwise specified in Chapter 16.

9.11 Emergency Control Systems. (Reserved)

9.12 Electrical Systems.

9.12.1 Electrical area classification shall not be required for liquid storage areas where all containers, intermediate bulk containers, and portable tanks are sealed and are not opened, except as provided for in 9.12.2.

9.12.2 For liquid storage rooms that are totally enclosed within the building, electrical wiring and utilization equipment for Class I liquid storage shall be Class I, Division 2 (Zone 2), and electrical wiring and utilization equipment in inside rooms used for the storage of Class II and Class III liquids shall be suitable for ordinary purpose.

Exception: Class I, Division 2 (Zone 2) requirements apply to Class II and Class III liquids when stored at temperatures above their flash points.

9.13* Containment, Drainage, and Spill Control.

9.13.1 Storage areas shall be designed and operated to prevent the discharge of liquids to public waterways, public sewers, or adjoining property, unless such discharge has been specifically approved.

9.13.1.1 Where the drainage system discharges to private or public sewers or waterways, the drainage system shall be equipped with traps and separators.

9.13.2 Where individual containers exceed 10 gal (38 L), curbs, scuppers, drains, or other suitable means shall be provided to prevent flow of liquids under emergency conditions into adjacent building areas.

9.13.3 Containment or drainage to an approved location shall be provided.

9.13.3.1 Where a drainage system is used, it shall also have sufficient capacity to carry the expected discharge of water from fire protection systems.

9.13.4 Where only Class IIIB liquids are stored, spill control, containment, and drainage shall not be required.

9.13.5 Where only unsaturated polyester resins (UPRs) containing not more than 50 percent by weight of Class IC, Class II, or Class IIIA liquid constituents are stored and are protected in accordance with 16.5.2.11, spill control, containment, and drainage shall not be required.

9.13.6 Where storage is protected in accordance with Chapter 16, spill control, containment, and drainage shall also meet the requirements of Section 16.8.

9.14 Ventilation.

Liquid storage areas where dispensing is conducted shall be provided with ventilation that meets the requirements of Section 18.5.

9.15 Exhausted Enclosures. (Reserved)

9.16 Explosion Control.

9.16.1* Where Class IA liquids are stored in containers larger than 1 gal (4 L), areas shall be provided with a means of explosion control that meets the requirements of NFPA 69, *Standard on Explosion Prevention Systems*. An approved engineered damage limiting construction design shall also be permitted.

Exception: This does not apply to a liquid storage room totally enclosed within a building.

9.16.2* Where unstable liquids are stored, an approved engineered construction method that is designed to limit damage from a deflagration or detonation, depending on the liquid stored, shall be used.

9.17 Separation from Incompatible Materials.

9.17.1 Liquids shall be separated from incompatible materials, such as products containing more than 5 percent by weight of acids, caustics, or oxidizers by a minimum distance of 25 ft (8 m).

Exception: As provided for in Section 10.17.

9.17.2 Liquids shall be separated from Level 2 and Level 3 aerosols in accordance with NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products*.

Exception: As provided for in Section 10.17.

9.17.3 Materials that are water-reactive, as described in NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, shall not be stored in the same control area with liquids.

9.18 Dispensing, Handling, and Use of Liquids in Storage Areas.

9.18.1 Dispensing, handling, and use of liquids shall meet all applicable requirements of Chapter 18.

9.18.2 Dispensing of Class I liquids or Class II and Class III liquids at temperatures at or above their flash points shall not be permitted in storage areas that exceed 1000 ft^2 (93 m^2) in floor area unless the dispensing area is separated from the storage areas in accordance with Table 9.9.1 and meets all other requirements of Section 9.9.

9.19 Outdoor Storage of Liquids.

Storage of liquids outside of buildings shall meet the requirements of Chapter 14 or Chapter 15, whichever is applicable.

Chapter 10 Storage of Liquids in Containers — Mercantile Occupancies

10.1 Scope.

10.1.1 This chapter shall apply to mercantile occupancies that handle, store, and display liquids in containers that do not exceed 119 gal (450 L) individual capacity.

10.1.2 This chapter shall also apply to limited dispensing of liquids incidental to mercantile operations.

10.1.3 This chapter shall not apply to the following:

(1) Containers, intermediate bulk containers, and portable tanks that are used in operations, as covered by Chapter 17

(2) Liquids in the fuel tanks of motor vehicles, aircraft, boats, or portable or stationary engines

(3) Beverages where packaged in individual containers that do not exceed 1.3 gal (5 L) capacity

(4) Medicines, foodstuffs, cosmetics, and other consumer products that contain not more than 50 percent by volume of water-miscible flammable or combustible liquids, with the remainder of the product consisting of components that do not burn and where packaged in individual containers that do not exceed 1.3 gal (5 L) capacity

(5) Liquids that have no fire point when tested in accordance with ASTM D 92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup*, up to the boiling point of the liquid or up to a temperature at which the liquid shows an obvious physical change

(6) Liquids with a flash point greater than 95°F (35°C) in a water-miscible solution or in dispersion with a water and noncombustible solids content of more than 80 percent by weight, and which do not sustain combustion when tested in accordance with "Method of Testing for Sustained Combustibility," Title 49 Code of Federal Regulations, Part 173, Appendix H, or the UN publication *Recommendations on the Transport of Dangerous Goods*

(7) Distilled spirits and wines in wooden barrels or casks

10.2 Definitions Specific to Chapter 10. (Reserved)

10.3 General Requirements.

10.3.1 For the purposes of this chapter, unstable liquids shall be treated as Class IA liquids.

10.3.2 Maximum allowable quantities of liquids for display and storage shall comply with Table 10.7.1, based on the level of protection provided.

10.3.3 The design, construction, and capacity of containers shall comply with the applicable provisions of Section 9.4.

10.3.4 Commonly accepted packagings for medicines, beverages, foodstuffs, cosmetics, and other common consumer products shall be exempt from the requirements of 9.4.1 and 9.4.3.

10.3.5 Where utilized within a mercantile occupancy, the design, construction, and capacity of storage cabinets shall comply with the applicable provisions of Section 9.5.

10.3.6* Where utilized within a mercantile occupancy, the design, construction, and operation of a separate liquid storage room or a hazardous material storage locker used as a separate inside liquid storage area shall comply with the applicable provisions of Chapter 9.

10.4 Reserved.

10.5 Reserved.

10.6 Reserved.

10.7 Control Areas.

10.7.1 The MAQs of liquids in each control area and in display and storage arrangements shall meet the requirements of this subsection and Table 10.7.1.

Table 10.7.1 MAQs for Storage and Display in Mercantile Occupancies

	Liquid Classification

10.7.1 The MAQs of liquids in each control area and in display and storage arrangements shall meet the requirements of this subsection and Table 10.7.1.

Table 10.7.1 MAQs for Storage and Display in Mercantile Occupancies

		Liquid Classification		
Level of Protection	**Storage Limits**	**IA**[1]	**IB, IC, II, and IIIA — Any Combination**	**IIIB**
Unprotected	MAQ[2]	60 gal	3750 gal per control area; a maximum of two control areas permitted per occupancy when separation is provided by a minimum 1-hour-rated fire separation wall	15,000 gal
	Maximum storage density		2 gal/ft^2 in storage and display areas and adjacent aisles	
NFPA 13, ordinary hazard (group 2) sprinkler system[3]	MAQ[2]	120 gal	7500 gal per control area; a maximum of two control areas permitted per occupancy when separation is provided by a minimum 1-hour-rated fire separation wall	Unlimited
	Maximum storage density		4 gal/ft^2 in storage and display areas and adjacent aisles	
NFPA 30, Chapter 16	MAQ[2]	120 gal	30,000 gal per occupancy	Unlimited

For SI units, 1 gal = 3.8 L; 1 ft^2 = 0.09 m^2.

[1] Ground-level floor only.

[2] Does not include liquids exempted by 10.1.3.

[3] For storage heights that do not exceed 12 ft (3.6 m).

10.7.2 Existing unprotected mercantile occupancies in place prior to January 1, 1997, are permitted to store or display up to 7500 gal (28,400 L) of Class IB, IC, II, and IIIA liquids (any combination) in each control area.

10.8 Specific Restrictions.

10.8.1 On floors above the ground level, storage or display of Class I and Class II liquids shall be limited to 60 gal (230 L) in unprotected occupancies and 120 gal (454 L) in protected occupancies.

10.8.2 Class I and Class II liquids shall not be stored, displayed, or dispensed in basements.

10.8.3 Liquids in containers of greater than 6 gal (23 L) capacity shall not be stored or displayed in areas normally accessible to the public.

10.8.4 Class II liquids that are not water-miscible and are packaged in plastic containers of 1 gal (3.8 L) capacity or greater shall be limited as follows:

(1) A maximum total quantity of 30 gal (115 L) per display or storage array

(2) A maximum total quantity of 60 gal (230 L) per display or storage array that is protected by an automatic sprinkler system having a design density of 0.60 gpm/ft² (24 mm/min/m²) over 2500 ft² (232 m²) and using high-temperature, K11.2 or larger quick-response sprinklers

(3) A maximum total quantity of 60 gal (230 L) per display or storage array where stored in listed flammable liquids storage cabinets

10.8.4.1 Adjacent displays or storage arrays shall be separated by a minimum distance of 50 ft (15 m).

10.9 Construction Requirements.

10.9.1 Separation walls between control areas shall meet the requirements of Table 10.7.1.

10.9.2 Where utilized within a mercantile occupancy, the construction of a separate liquid storage room or a hazardous material storage locker used as a separate inside liquid storage room shall comply with the applicable provisions of Chapter 9. *(See A.10.3.6.)*

10.10 Fire Protection.

10.10.1 Where provided, automatic sprinkler systems shall meet the design requirements of Table 10.7.1.

10.10.2 Protection systems for storage and display of liquids that are designed and developed based on full-scale tests performed at an approved test facility shall be considered an acceptable alternative to the protection criteria set forth in Chapter 16. Such alternative protection systems shall be approved by the authority having jurisdiction.

10.10.3 Portable fire extinguishers shall be provided where liquids are stored.

10.10.4 Hoseline connections shall be provided where required by NFPA 13, *Standard for the Installation of Sprinkler Systems*.

10.11 Emergency Control Systems. (Reserved)

10.12 Electrical Systems.

10.12.1 Electrical wiring and utilization equipment shall meet the requirements of Chapter 7.

10.12.2 Electrical area classification shall not be required for liquid storage areas where all containers, intermediate bulk containers, and portable tanks are sealed and are not opened, except as provided for in 9.12.2.

10.13 Containment, Drainage, and Spill Control.

10.13.1 Where individual containers exceed 10 gal (38 L) and protection has been provided in accordance with Chapter 16, containment and drainage shall be provided, in accordance with Section 16.8. *(See also Section 9.13.)*

10.13.2 Where utilized within a mercantile occupancy, spill containment for separate liquid storage rooms and for hazardous material storage lockers used as separate liquid storage rooms shall meet applicable requirements of Section 9.13. *(See A.10.3.6.)*

10.14 Ventilation.

Liquid storage areas where dispensing is conducted shall be provided with either a gravity ventilation system or a continuous mechanical exhaust ventilation system that meets the requirements of Section 18.5. Mechanical ventilation shall be used if Class I liquids are dispensed within the room.

10.15 Exhausted Enclosures. (Reserved)

10.16 Explosion Control. (Reserved)

10.17 Separation from Incompatible Materials.

10.17.1 Display and storage of liquids shall be separated from incompatible materials, such as products containing more than 5 percent by weight of acids, caustics, or oxidizers by a minimum distance of 25 ft (8 m).

10.17.2 Liquids shall be separated from Level 2 and Level 3 aerosols in accordance with NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products*. [**30B:**6.3]

10.18 Dispensing, Handling, and Use of Liquids in Mercantile Occupancies.

Dispensing, handling, and use of liquids shall meet applicable requirements of Chapter 18.

Exception: This requirement does not apply to dispensing of quantities that do not exceed 16 oz (0.5 L) including, but not limited to, tinting of paints and coatings.

10.19 Outdoor Storage of Liquids.

Storage outside of buildings at mercantile occupancies shall meet the requirements of Chapter 14 or Chapter 15, whichever is applicable.

Chapter 11 Storage of Liquids in Containers — Industrial Occupancies

11.1 Scope.

This chapter shall apply to the storage of flammable and combustible liquids in industrial occupancies in the following:

(1) Containers that do not exceed 119 gal (450 L) individual capacity

(2) Portable tanks that do not exceed 660 gal (2500 L) individual capacity

(3) Intermediate bulk containers that do not exceed 793 gal (3000 L)

11.2 Definitions Specific to Chapter 11. (Reserved)

11.3 General Requirements.

The storage of liquids shall comply with either Chapter 9 or Section 18.4 of this code.

Chapter 12 Storage of Liquids in Containers — Storage Occupancies

12.1 Scope.

This chapter shall apply to the storage of liquids in liquid storage rooms, liquid warehouses, and general purpose warehouses in the following:

(1) Drums or other containers that do not exceed 119 gal (450 L) individual capacity

(2) Portable tanks that do not exceed 660 gal (2500 L) individual capacity

(3) Intermediate bulk containers that do not exceed 793 gal (3000 L) individual capacity

12.2 Definitions Specific to Chapter 12. (Reserved)

12.3 General Requirements.

12.3.1 A general-purpose warehouse that stores liquids in quantities that do not exceed the MAQs permitted in control areas by Table 9.6.1 or that do not exceed the amounts permitted by Section 12.8 shall meet the requirements of Section 12.8.

12.3.2 A general-purpose warehouse that stores liquids in quantities that exceed the MAQs permitted in control areas by Table 9.6.1 or that exceed the amounts permitted by Section 12.8 shall meet the requirements for a liquid storage room or liquid warehouse, whichever is applicable.

12.3.3 Facilities covered by this chapter shall meet the requirements of Section 9.3.

12.3.4 For the purposes of this chapter, protected storage shall mean storage installed after January 1, 1997, that is protected in accordance with Chapter 16. All other storage shall be considered unprotected storage unless an alternate means of protection has been approved by the authority having jurisdiction. *(See 16.3.6 and Section 16.9.)*

12.3.5 Protected and unprotected solid pile and palletized storage shall be provided with aisles that are arranged so that no container, portable tank, or intermediate bulk container is more than 20 ft (6 m) from an aisle.

12.3.6 Protected solid pile and palletized storage and protected storage on racks shall be provided with minimum 6 ft (1.8 m) aisles between adjacent piles or adjacent rack sections, unless otherwise specified in Chapter 16.

12.3.7 Unprotected solid pile and palletized storage shall be provided with minimum 4 ft (1.2 m) aisles between adjacent piles. Main aisles shall be a minimum of 8 ft (2.4 m) wide.

Exception: For Class IIIB liquids in containers, the distance between piles is permitted to be reduced from 4 ft (1.2 m) to 2 ft (0.6 m) in proportion to commensurate reductions in the maximum storage height and maximum quantity per pile as given in Table 12.6.2.2.

12.3.8 Unprotected rack storage shall be provided with minimum 4 ft (1.2 m) aisles between adjacent rack sections and adjacent storage of liquids. Main aisles shall be a minimum of 8 ft (2.4 m) wide.

12.3.9 Storage of empty or idle combustible pallets inside protected liquid storage areas shall comply with NFPA 13, *Standard for the Installation of Sprinkler Systems*.

12.3.10 Storage of empty or idle combustible pallets inside unprotected liquid storage areas shall be limited to a maximum pile size of 2500 ft^2 (230 m^2) and to a maximum storage height of 6 ft (1.8 m).

12.3.11 Storage of empty or idle combustible pallets shall be separated from storage of liquids by minimum 8 ft (2.4 m) aisles.

12.4 Reserved.

12.5 Reserved.

12.6 Maximum Allowable Quantities and Maximum Storage Heights.

12.6.1 Liquid Storage Rooms.

12.6.1.1 Storage of liquids in liquid storage rooms shall meet the requirements specified in Table 12.6.1.1.

Table 12.6.1.1 Quantity Limitations for Liquid Storage Rooms

Total Floor Area (ft^2)	Automatic Fire Protection Provided?*	Total Allowable Quantity (gal/ft^2 of floor area)
≤150	No	2
	Yes	5
>150 and ≤500	No	4†
	Yes	10

For SI units, 1 ft^2 = 0.09 m^2; 1 gal = 3.8 L.

*The fire protection system can be automatic sprinklers, water spray, carbon dioxide, dry chemical, or other approved system. *(See Chapter 16.)*

†Total allowable quantities of Class IA and IB liquids cannot exceed the quantities permitted in Table 12.6.2.2 or those permitted by 12.6.2.3.

12.6.1.2 Containers over 30 gal (115 L) capacity that contain Class I or Class II liquids shall not be stacked more than one container high unless protected in accordance with Chapter 16.

Exception: This requirement does not apply to liquid storage rooms and hazardous materials storage lockers that are located in a liquid warehouse and are provided with equal or greater fire protection than is provided for the warehouse itself.

12.6.2 Liquid Warehouses.

12.6.2.1 The total quantity of liquid stored in a protected liquid warehouse shall not be limited.

12.6.2.2 Except as provided for in Chapter 9 and Chapter 13, unprotected liquid warehouses shall meet the requirements specified in Table 12.6.2.2.

Table 12.6.2.2 Quantity Limitations for Unprotected Liquid Warehouses

warehouse itself.

12.6.2 Liquid Warehouses.

12.6.2.1 The total quantity of liquid stored in a protected liquid warehouse shall not be limited.

12.6.2.2 Except as provided for in Chapter 9 and Chapter 13, unprotected liquid warehouses shall meet the requirements specified in Table 12.6.2.2.

Table 12.6.2.2 Quantity Limitations for Unprotected Liquid Warehouses

	Containers			Metal Portable Tanks and Metal IBCs			Rigid Nonmetallic IBCs	
Liquid Class	**Maximum Storage Height (ft)**	**Maximum Total Quantity per Pile or Rack Section (gal)**	**Maximum Total Quantity (gal)**	**Maximum Storage Height (ft)**	**Maximum Total Quantity per Pile or Rack Section (gal)**	**Maximum Total Quantity (gal)**	**Maximum Storage Height (ft)**	**Maximun Total Quan per Pile or Rack Section (gal)**
IA	5	660	660	NP	NP	NP	NP	NP
IB	5	1,375	1,375	7	2,000	2,000	NP	NP
IC	5	2,750	2,750	7	4,000	4,000	NP	NP
II	10	4,125	8,250	7	5,500	11,000	7	4,125
IIIA	15	13,750	27,500	7	22,000	44,000	7	13,750
IIIB	15	13,750	55,000	7	22,000	88,000	7	13,750

For SI units, 1 ft = 0.3 m; 1 gal = 3.8 L.
NP: Not permitted.

12.6.2.3 Where two or more classes of liquids are stored in a single pile or rack section, the following shall apply:

(1) The maximum quantity per pile or rack section and the maximum storage height permitted shall be the smallest of the individual maximum quantities per pile or rack section and maximum storage heights for the specific classes present, respectively.

(2) The maximum quantity per pile or rack section shall be limited to the sum of the proportional amounts that each class of liquid present bears to the maximum quantity per pile or rack section allowed for its respective class.

(3) The sum of the proportional amounts shall not exceed 100 percent.

12.7 Control Areas.

Control areas shall be in accordance with Section 9.7.

12.8 General-Purpose Warehouses Storing Liquids in Quantities Not Exceeding the MAQ.

12.8.1* Class IB and IC liquids in containers of 1.3 gal (5 L) or less capacity, Class II liquids in containers of 5.3 gal (20 L) or less capacity, Class IIIA liquids in containers of 60 gal (230 L) or less capacity, and Class IIIB liquids in containers, intermediate bulk containers, or portable tanks of 275 gal (1040 L) or less capacity shall be permitted to be stored in warehouses that handle combustible commodities, as defined in NFPA 13, *Standard for the Installation of Sprinkler Systems*, provided that the storage area for liquids is protected with automatic sprinklers in accordance with either of the following:

(1) The provisions of NFPA 13 for 20 ft (6 m) high storage of Class IV commodities

(2) The provisions of Chapter 16

12.8.2 The quantities and height of liquid storage are limited to the following:

(1) Class IA liquids: not permitted

(2) Class IB and IC liquids: 660 gal (2500 L), maximum 5 ft (1.5 m) high pile stored on floor, with no rack or other storage above

(3) Class II liquid: 1375 gal (5200 L), maximum 5 ft (1.5 m) high pile stored on floor, with no rack or other storage above

(4) Class IIIA liquid: 2750 gal (10,400 L), maximum 10 ft (3 m) high pile stored on floor, with no rack or other storage above or in storage racks to a maximum height of 10 ft (3 m)

(5) Class IIIB liquid: 13,750 gal (52,000 L), maximum 15 ft (4.6 m) high pile stored on floor, with no rack or other storage above or in storage racks to a maximum height of 15 ft (4.6 m)

12.8.3 Where two or more classes of liquids are stored in a single pile or rack section, the following shall apply:

(1) The maximum total quantity and maximum storage height permitted shall be the smallest of the individual maximum total quantities and maximum storage heights for the specific classes present, respectively.

(2) The maximum total quantity permitted shall be limited to the sum of the proportional amounts that each class of liquid present bears to the maximum total quantity permitted for its respective class.

(3) The sum of the proportional amounts shall not exceed 100 percent.

12.8.4* Liquids in Plastic Containers. Class I and Class II liquids in plastic containers shall not be stored in a general-purpose warehouse but shall be stored in a liquid storage room or liquid storage warehouse that meets the requirements of this chapter.

Exception No. 1: The following liquids, packaged in plastic containers, are permitted to be stored in general-purpose warehouses in accordance with the protection and storage limitations specified in Section 12.8 as follows:

(1) Products containing not more than 50 percent by volume of water-miscible liquids, with the remainder of the product consisting of components that do not burn and where packaged in individual containers

(2) Products containing more than 50 percent water-miscible liquids in individual containers not exceeding 16 oz (0.5 L) capacity in cartons

Exception No. 2: Class I and Class II liquids in plastic containers are permitted to be stored in a general-purpose warehouse if the packaging systems are listed and labeled for use with these commodities. All other provisions of Section 12.8 also apply.

12.8.5 The following shall apply to the storage of liquids and ordinary combustible commodities in general purpose warehouses:

(1) Liquids shall not be stored in the same pile or in the same rack sections as ordinary combustible commodities. Where liquids are packaged together with ordinary combustibles, as in kits, the storage shall be considered on the basis of whichever commodity predominates.

(2) Except as provided for in 12.8.5(1), ordinary combustible commodities shall be separated from liquids in containers by a minimum distance of 8 ft (2.4 m).

12.9 Construction Requirements.

Storage areas shall be constructed in accordance with Section 9.9.

12.10 Fire Protection.

Fire protection for protected storage shall be in accordance with Chapter 16.

12.11 Emergency Control Systems. (Reserved)

12.12 Electrical Systems.

Installation of electrical wiring and utilization equipment shall meet the requirements of Chapter 7 and Section 9.12.

12.13 Containment, Drainage, and Spill Control.

Where individual containers exceed 10 gal (38 L), spill control shall be in accordance with Section 9.13.

12.14 Ventilation.

Liquid storage areas where dispensing is conducted shall be provided with ventilation that meets the requirements of Section 18.5.

12.15 Exhausted Enclosures. (Reserved)

12.16 Explosion Control.

Where required by Section 9.16, explosion control shall be provided and shall meet the requirements of that section.

12.17 Separation from Incompatible Materials. (Reserved)

12.18 Dispensing, Handling, and Use of Liquids in Storage Occupancies.

Dispensing, handling, and use in storage areas shall be in accordance with Chapter 18.

12.19 Outdoor Storage of Liquids.

Storage outside of buildings shall meet the requirements of Chapter 14 or Chapter 15, whichever is applicable.

Chapter 13 Storage of Liquids in Containers — Detached, Unprotected Buildings

13.1 Scope.

This chapter shall apply to the storage of flammable and combustible liquids in detached, unprotected buildings, in the following:

(1) Drums or other containers that do not exceed 119 gal (450 L) individual capacity

(2) Portable tanks that do not exceed 660 gal (2500 L) individual capacity

(3) Intermediate bulk containers that do not exceed 793 gal (3000 L)

13.2 Definitions Specific to Chapter 13. (Reserved)

13.3 General Requirements.

13.3.1 The building shall have a horizontal separation of at least 200 ft (60 m) from exposed business, industrial, mercantile, and storage occupancies on the same property and from any property line that is or can be built upon. Where protection for exposures is provided, the horizontal separation shall be at least 100 ft (30 m).

13.3.2 The building shall have a horizontal separation of at least 1000 ft (300 m) from exposed occupancies other than business, industrial, mercantile, and storage on the same property and from any property line that is or can be built upon. Where protection for exposures is provided, the horizontal separation shall be at least 500 ft (150 m).

13.3.3 Means of egress from the building shall not exceed 75 ft (23 m).

13.3.4 Rack storage shall be arranged with minimum 4 ft (1.2 m) wide aisles between adjacent rack sections and between liquid storage and any adjacent storage.

13.3.5 Solid pile and palletized storage shall be arranged so that piles are separated from each other by at least 4 ft (1.2 m). Aisles shall be provided and arranged so that no container or portable tank is more than 20 ft (6 m) from an aisle.

Exception: For Class IIIB liquids in containers, the distance between piles is permitted to be reduced from 4 ft (1.2 m) to 2 ft (0.6 m) in proportion to commensurate reductions in maximum quantity per pile and maximum storage height, as given in Table 12.6.2.2.

13.3.6 Limited quantities of combustible commodities, as defined in NFPA 13, *Standard for the Installation of Sprinkler Systems*, shall be permitted to be stored in liquid storage areas if the ordinary combustibles, other than those used for packaging the liquids, are separated from the liquids in storage by a minimum of 8 ft (2.4 m) horizontally either by aisles or by open racks.

13.3.7 Storage of empty or idle combustible pallets shall be limited to a maximum pile size of 2500 ft^2 (230 m^2) and to a maximum storage height of 6 ft (1.8 m).

13.3.7.1 Pallet storage shall be separated from liquid storage by aisles that are at least 8 ft (2.4 m) wide.

13.3.8 Containers, intermediate bulk containers, and portable tanks shall not be stored closer than 36 in. (915 mm) to the nearest beam, chord, girder, or other roof member.

13.4 Reserved.

13.5 Reserved.

13.6 Maximum Allowable Quantities and Maximum Storage Heights.

13.6.1 The total quantity of liquids stored in a detached unprotected liquid storage building shall not be limited.

13.6.2 Storage of liquids in piles or racks in a detached, unprotected liquid storage building shall not exceed the maximum storage height and maximum quantity per pile or rack section allowed by Table 12.6.2.2.

13.6.3 Where two or more classes of liquids are stored in a single pile or rack section, the following shall apply:

(1) The maximum quantity per pile or rack section and the maximum storage height permitted shall be the smallest of the individual maximum quantities per pile or rack section and maximum storage heights for the specific classes present, respectively.

(2) The maximum quantity per pile or rack section shall be limited to the sum of the proportional amounts that each class of liquid present bears to the maximum quantity per pile or rack section allowed for its respective class.

(3) The sum of the proportional amounts shall not exceed 100 percent.

13.7 Control Areas. (Reserved)

13.8 Reserved.

13.9 Construction Requirements.

13.9.1 The building shall not exceed one story in height.

13.9.2 The building shall not have basements, crawlspaces, or other accessible underfloor areas.

13.10 Fire Protection.

13.10.1 Automatic fire protection systems shall not be required.

13.10.2 Manual fire-fighting equipment needed for incipient-level fire protection shall be provided in accordance with 9.10.2.

13.11 Emergency Control Systems. (Reserved)

13.12 Electrical Systems.

Installation of electrical wiring and utilization equipment shall meet the requirements of Chapter 7 and Section 9.12.

13.13 Containment, Drainage, and Spill Control.

13.13.1 Where individual containers exceed 10 gal (38 L), spill control shall be provided in accordance with Section 9.13.

13.13.2 Containment or drainage shall be provided in accordance with Section 9.13.

Exception: Containment or drainage need not be provided for fire protection water if the building does not have a water-based fire protection system.

13.14 Ventilation.

Liquid storage areas where dispensing is conducted shall be provided with ventilation that meets the requirements of Section 18.5.

13.15 Exhausted Enclosure. (Reserved)

13.16 Explosion Control.

Where required by Section 9.16, explosion control shall be provided and shall meet the requirements of that section.

13.17 Separation from Incompatible Materials. (Reserved)

13.18 Dispensing, Handling, and Use of Liquids in Detached, Unprotected Buildings.

Dispensing, handling, and use in storage areas shall be in accordance with Chapter 18.

13.19 Outdoor Storage of Liquids.

Storage outside of buildings shall meet the requirements of Chapter 14 or Chapter 15, whichever is applicable.

Chapter 14 Hazardous Materials Storage Lockers

14.1* Scope.

This chapter shall apply to the storage of liquids in movable, modular, prefabricated storage lockers, specifically designed and manufactured for storage of hazardous materials, in the following:

(1) Containers that do not exceed 119 gal (450 L) individual capacity

(2) Portable tanks that do not exceed 660 gal (2500 L) individual capacity

(3) Intermediate bulk containers that do not exceed 793 gal (3000 L) individual capacity

14.2 Definitions Specific to Chapter 14. (Reserved)

14.3 General Requirements.

14.3.1 Hazardous materials storage lockers that are used as liquid storage rooms shall meet the requirements of Chapter 9.

14.3.2 Sections 14.3 and 14.4 shall apply to storage of flammable and combustible liquids in hazardous materials storage lockers (hereinafter referred to as lockers) that are located outside.

14.4 Design and Construction of Hazardous Materials Storage Lockers.

14.4.1 The design and construction of a locker shall meet all applicable local, state, and federal regulations and requirements and shall be subject to the approval of the authority having jurisdiction.

14.4.2 Movable prefabricated structures that have been examined, listed, or labeled by an organization acceptable to the authority having jurisdiction for use as a hazardous materials storage facility shall be acceptable.

14.4.3 Lockers shall not exceed 1500 ft^2 (140 m^2) gross floor area.

14.4.4 Vertical stacking of lockers shall not be permitted.

14.4.5 Where electrical wiring and equipment are required, they shall comply with Chapter 7 and Section 9.12.

14.4.6 Where dispensing or filling is permitted inside a locker, operations shall comply with the provisions of Chapter 18.

14.4.7 Ventilation shall be provided in accordance with Section 18.5.

14.4.8 Lockers shall include a spill containment system to prevent the flow of liquids from the structure under emergency conditions.

14.4.8.1 The containment system shall have sufficient capacity to contain 10 percent of the volume of containers allowed in the locker or the volume of the largest container, whichever is greater.

14.5 Designated Sites for Hazardous Materials Storage Lockers.

14.5.1 Lockers shall be located on a designated approved site on the property.

14.5.2 The designated site shall be arranged to provide the minimum separation distances specified in Table 14.5.2 between individual lockers, from locker to property line that is or can be built upon, and from locker to nearest side of public ways or to important buildings on the same property.

Table 14.5.2 Designated Sites

Area of Designated Site[a] (ft^2)	Minimum Separation Distance (ft)		
	Between Individual Lockers	From Locker to Property Line That Is or Can Be Built Upon[b]	From Locker to Nearest Side of Public Ways or to Important Buildings on Same Property[b,c]
≤100	5	10	5
>100 and ≤500	5	20	10
>500 and ≤1500[d]	5	30	20

Table 14.5.2 Designated Sites

Area of Designated Site[a] (ft^2)	Minimum Separation Distance (ft) Between Individual Lockers	From Locker to Property Line That Is or Can Be Built Upon[b]	From Locker to Nearest Side of Public Ways or to Important Buildings on Same Property[b,c]

For SI units, 1 ft = 0.3 m; 1 ft^2 = 0.09 m^2.

Note: If the locker is provided with a fire resistance rating of not less than 4 hours and deflagration venting is not required in accordance with Section 9.15, all distances required by Table 14.5.2 are permitted to be waived.

[a]Site area limits are intended to differentiate the relative size and thus the number of lockers that are permitted in one designated site.

[b]Distances apply to properties that have protection for exposures, as defined. If there are exposures and such protection for exposures does not exist, the distances should be doubled.

[c]When the exposed building has an exterior wall, facing the designated site, that has a fire resistance rating of at least 2 hours and has no openings to above grade areas within 10 ft (3 m) horizontally and no openings to below grade areas within 50 ft (15 m) horizontally of the designated area, the distances can be reduced to half of those shown in the table, except they should never be less than 5 ft (1.5 m).

[d]When a single locker has a gross single story floor area that will require a site area limit of greater than 1500 ft^2 (140 m^2) or when multiple units exceed the area limit of 1500 ft^2 (140 m^2), the authority having jurisdiction should be consulted for approval of distances.

14.5.3 Once the designated site is approved, it shall not be changed without the approval of the authority having jurisdiction.

14.5.4 More than one locker shall be permitted on a designated site, provided that the separation distance between individual lockers is maintained in accordance with Table 14.5.2.

14.5.5 Where the approved designated storage site is accessible to the general public, it shall be protected from tampering or trespassing.

14.6 Storage Requirements.

14.6.1 Containers of liquid in their original shipping packages shall be permitted to be stored either palletized or solid piled.

14.6.2 Unpackaged containers shall be permitted to be stored on shelves or directly on the floor of the locker.

14.6.3 Containers over 30 gal (114 L) capacity storing Class I or Class II liquids shall not be stored more than two containers high.

14.6.4 In all cases, the storage arrangement shall provide unrestricted access to and egress from the locker.

14.6.5 Miscellaneous combustible materials, including but not limited to idle pallets, excessive vegetation, and packing materials, shall not be permitted within 5 ft (1.5 m) of the designated site approved for lockers.

14.6.6 Warning signs for lockers shall be in accordance with applicable local, state, and federal regulations or with NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*.

Chapter 15 Outdoor Storage

15.1 Scope.

This chapter shall apply to the storage of liquids outdoors in the following:

(1) Drums or other containers that do not exceed 119 gal (450 L) individual capacity

(2) Portable tanks that do not exceed 660 gal (2500 L) individual capacity

(3) Intermediate bulk containers that do not exceed 793 gal (3000 L) individual capacity

15.2 Definitions Specific to Chapter 15. (Reserved)

15.3 General Requirements.

Outdoor storage of liquids in containers, intermediate bulk containers, and portable tanks shall comply with Table 15.3 and with all applicable requirements of this chapter.

Table 15.3 Storage Limitations for Outside Storage

	Containers		Portable Tanks and Metal IBCs		Rigid Plastic and Composite IBCs		Minimum Separation Distance		
Liquid Class	Maximum Quantity per Pile (gal)[a,b,c]	Maximum Storage Height (ft)	Maximum Quantity per Pile (gal)	Maximum Storage Height (ft)	Maximum Quantity per Pile (gal)[a,c]	Maximum Storage Height (ft)	Between Piles or Rack Sections	To Property Line That Is or Can Be Built Upon[b,d]	To All Publ
IA	1,100	10	2,200	7	NP	NP	5	50	
IB	2,200	12	4,400	14	NP	NP	5	50	
IC	4,400	12	8,800	14	NP	NP	5	50	
II	8,800	12	17,600	14	8,800	14	5	25	
III	22,000	18	44,000	14	22,000	18	5	10	

For SI units, 1 ft = 0.3 m; 1 gal = 3.8 L.

NP: Not permitted.

[a]See 15.3.1 regarding mixed-class storage.

[b]See 15.3.4 for smaller pile sizes.

[c]For storage in racks, the quantity limits per pile do not apply, but the rack arrangements should be limited to a maximum of 50 ft (15 m) in len and two rows or 9 ft (2.7 m) in depth.

[d]See 15.3.3 regarding protection for exposures.

15.3.1 Where two or more classes of liquids are stored in a single pile, the maximum quantity permitted in that pile shall be that of the most hazardous class of liquid present.

15.3.2 No container, intermediate bulk container, or portable tank in a pile shall be more than 200 ft (60 m) from a minimum 20 ft (6 m) wide access way to permit approach of fire control apparatus under all weather conditions.

15.3.3 The distances specified in Table 15.3 shall apply to properties that have protection for exposures as defined. If there are exposures and protection for exposures does not exist, the distance to the property line that is or can be built upon shall be doubled.

15.3.4 Where total quantity stored does not exceed 50 percent of the maximum quantity per pile, as specified in Table 15.3, the distances to a property line that is or can be built upon and to streets, alleys, or public ways shall be permitted to be reduced by 50 percent but in no case to less than 3 ft (0.9 m).

15.3.5 The storage area shall be graded in a manner to divert possible spills away from buildings or other exposures or shall be surrounded by a curb at least 6 in. (150 mm) high.

15.3.5.1 Where curbs are used, provisions shall be made to drain accumulations of groundwater or rainwater or spills of liquids. Drains shall terminate at a safe location and shall flow freely under fire conditions.

15.3.6 The storage area shall be protected against tampering or trespassers where necessary.

15.3.7 The storage area shall be kept free of weeds, debris, and other combustible materials not necessary to the storage.

15.3.8 The storage area shall be permitted to be protected from the weather by a canopy or roof that does not limit the dissipation of heat or dispersion of flammable vapors and does not restrict fire-fighting access and control.

15.4 Outdoor Storage Adjacent to a Building.

15.4.1 A maximum of 1100 gal (4160 L) of liquids in containers, intermediate bulk containers, or portable tanks shall be permitted to be stored adjacent to a building under the same management, provided the following conditions apply:

(1) The adjacent building wall has an exterior fire resistance rating of 2 hours.

(2) The adjacent building wall has no openings at grade or above grade that are within 10 ft (3 m) horizontally of the storage.

(3) The adjacent building wall has no openings directly above the storage.

(4) The adjacent building wall has no openings below grade within 50 ft (15 m) horizontally of the storage.

15.4.2 The provisions of 15.4.1(1) through 15.4.1(4) shall be permitted to be waived, subject to the approval of the authority having jurisdiction, if the building in question is one story, is of fire-resistive or noncombustible construction, and is devoted principally to the storage of liquids.

15.4.3 The quantity of liquid stored adjacent to a building that meets the conditions of 15.4.1(1) through 15.4.1(4) shall be permitted to exceed that permitted in 15.4.1, provided the maximum quantity per pile does not exceed 1100 gal (4160 L) and each pile is separated by a 10 ft (3 m) minimum clear space along the common wall.

15.4.4 The quantity of liquid stored shall be permitted to exceed the 1100 gal (4160 L) quantity specified by 15.4.1 where a minimum distance equal to that specified by Table 15.3 for distance to property line shall be maintained between buildings and the nearest container or portable tank.

15.4.5 Where the provisions of 15.4.1 cannot be met, a minimum distance equal to that specified by Table 15.3 for distance to property line shall be maintained between buildings and the nearest container or portable tank.

Chapter 16 Automatic Fire Protection for Inside Liquid Storage Areas

16.1 Scope.

16.1.1* This chapter shall apply to automatic fire protection systems for all inside storage of flammable and combustible liquids in containers, intermediate bulk containers, and portable tanks as specified in Section 9.4.

16.1.2* This chapter shall not apply to Class IA flammable liquids or to unstable flammable or combustible liquids.

16.1.3 Storage of liquids that is protected in accordance with the applicable requirements of this chapter shall be considered protected, as defined in 16.2.2. All other storage shall be considered unprotected unless an alternate means of protection has been approved by the authority having jurisdiction.

16.2 Definitions Specific to Chapter 16.

For the purpose of this chapter, the following terms shall be defined as shown in this section.

16.2.1 IBC. Where used in this chapter, *IBC* refers to intermediate bulk containers.

16.2.2 Protected Storage. Flammable and combustible liquids storage that is protected in accordance with this chapter.

16.2.3* Relieving-Style Container. A metal container, a metal intermediate bulk container, or a metal portable tank that is equipped with at least one pressure-relieving mechanism at its top that is designed, sized, and arranged to relieve the internal pressure generated due to exposure to fire so that violent rupture is prevented.

16.2.4* Unsaturated Polyester Resin (UPR). A resin that contains up to 50 percent by weight of Class IC, Class II, or Class III liquid, but no Class IA or Class IB liquid.

16.2.5 Viscous Liquid. A liquid that gels, thickens, or solidifies when heated or whose viscosity at room temperature versus weight percent content of Class I, Class II, or Class III liquid is in the shaded portion of Figure 16.2.5.

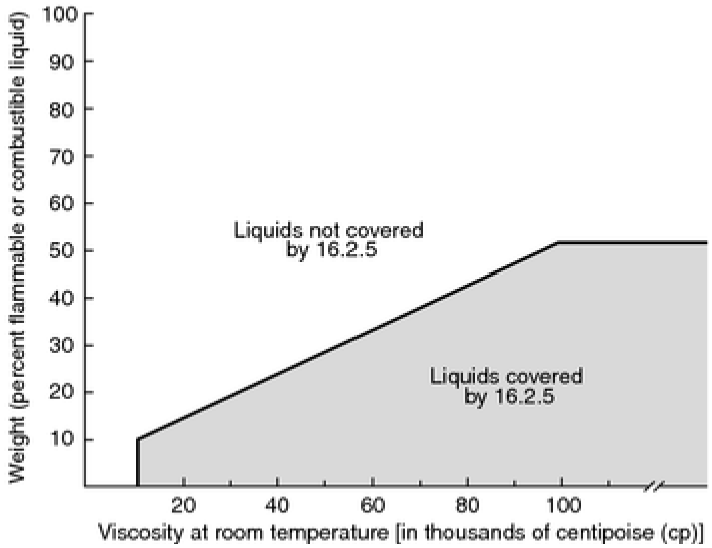


FIGURE 16.2.5 Viscous Liquid: Viscosity Versus Weight Percent Flammable or Combustible Component.

16.2.6 Water-Miscible Liquid. A liquid that mixes in all proportions with water without the use of chemical additives, such as emulsifying agents.

16.3 General Requirements.

16.3.1 The total quantity of liquids stored in a liquid warehouse shall not be restricted.

16.3.2 Where different classes of liquids, container types, and storage configurations are stored in the same protected area, protection shall meet either of the following:

(1) Requirements of this chapter for the most severe storage fire hazard present

(2) Where areas are not physically separated by a barrier or partition capable of delaying heat from a fire in one hazard area from fusing sprinklers in an adjacent hazard area, the required protection for the more demanding hazard shall:

   (a) Extend 20 ft (6 m) beyond its perimeter, but not less than the required minimum sprinkler design area

   (b) Be provided with means to prevent the flow of burning liquid under emergency conditions into adjacent hazard areas

   (c) Provide containment and drainage as required by Section 16.8

16.3.3 Unless otherwise specified in this chapter, single-row racks shall not be more than 4.5 ft (1.4 m) wide and double-row racks shall not be more than 9 ft (2.8 m) wide.

16.3.4 When applying the fire protection criteria of this chapter, a minimum aisle space of 6 ft (1.8 m) shall be provided between adjacent piles or adjacent rack sections, unless otherwise specified in the tables in Section 16.5.

16.3.5 Viscous liquids, as defined in 16.2.5, shall be permitted to be protected using either of the following, as applicable:

(1) Criteria for a Class IIIB liquid in accordance with Figure 16.4.1(a) or Figure 16.4.1(b)

(2) Criteria for Group A plastics in accordance with Figure 16.4.1(b)

16.3.6 Protection systems that are designed and developed based on full-scale fire tests performed at an approved test facility or on other engineered protection schemes shall be considered an acceptable alternative to the protection criteria set forth in this chapter. Such alternative protection systems shall be approved by the authority having jurisdiction.

16.3.7 For relieving-style containers of greater than 6.6 gal (25 L) and up to 119 gal (450 L) capacity, the following shall apply:

(1) The pressure-relieving mechanism shall be listed and labeled in accordance with FM Global Approval, *Examination Program for Fusible Closures for Steel Drums*, Class Number 6083, or equivalent.

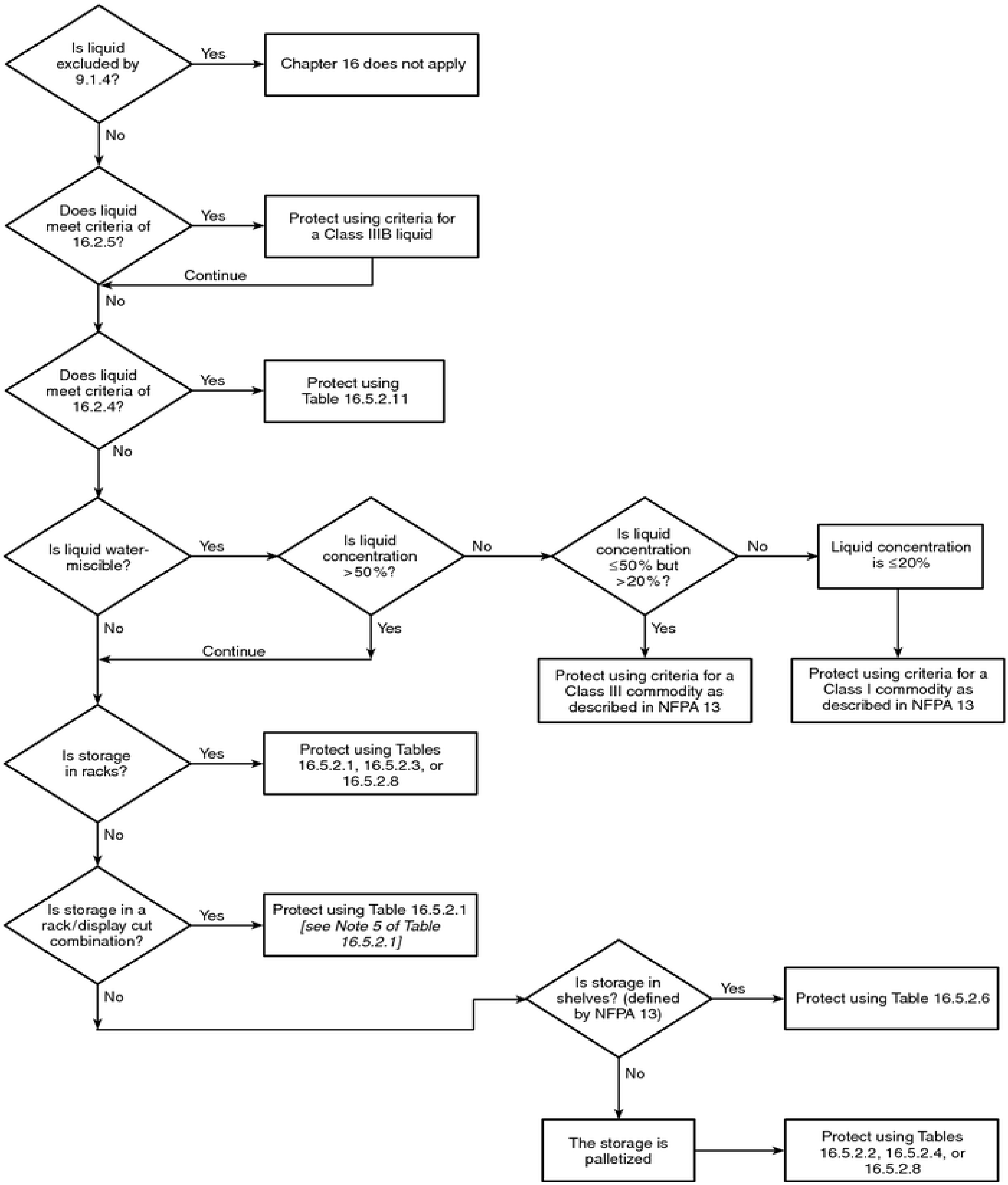
(2) The pressure-relieving mechanism shall not be painted, and cap seals, if used, shall be made of thermoplastic material.

(3) For metal containers greater than 6.6 gal (25 L) capacity, the pressure-relieving mechanism shall be unobstructed or an additional pressure-relieving mechanism shall be provided.

16.3.8 To be considered protected by Table 16.5.2.9 and Table 16.5.2.10, rigid nonmetallic intermediate bulk containers shall be subjected to a standard fire test that demonstrates acceptable inside storage fire performance and shall be listed and labeled.

16.4 Automatic Sprinkler and Foam-Water Sprinkler Fire Protection Systems.

16.4.1 Where automatic sprinkler systems or low-expansion foam-water sprinkler systems are used to protect storage of liquids, Figure 16.4.1(a), Figure 16.4.1(b), or Figure 16.4.1(c), whichever is applicable, and the appropriate table in Section 16.5 shall be used to determine protection criteria.



Is liquid excluded by 9.1.4?
Yes
Chapter 16 does not apply
No
Does liquid meet criteria of 16.2.5?
Yes
Protect using criteria for a Class IIIB liquid
Continue
No
Does liquid meet criteria of 16.2.4?
Yes
Protect using Table 16.5.2.11
No
Is liquid water-miscible?
Yes
Is liquid concentration >50%?
No
Is liquid concentration ≤50% but >20%?
No
Liquid concentration is ≤20%
No
Yes
Continue
Yes
Protect using criteria for a Class III commodity as described in NFPA 13
Protect using criteria for a Class I commodity as described in NFPA 13
Is storage in racks?
Yes
Protect using Tables 16.5.2.1, 16.5.2.3, or 16.5.2.8
No
Is storage in a rack/display cut combination?
Yes
Protect using Table 16.5.2.1 [see Note 5 of Table 16.5.2.1]
No
Is storage in shelves? (defined by NFPA 13)
Yes
Protect using Table 16.5.2.6
No
The storage is palletized
Protect using Tables 16.5.2.2, 16.5.2.4, or 16.5.2.8

FIGURE 16.4.1(a) Fire Protection Criteria Decision Tree for Miscible and Nonmiscible Flammable and Combustible Liquids in Metal Containers.

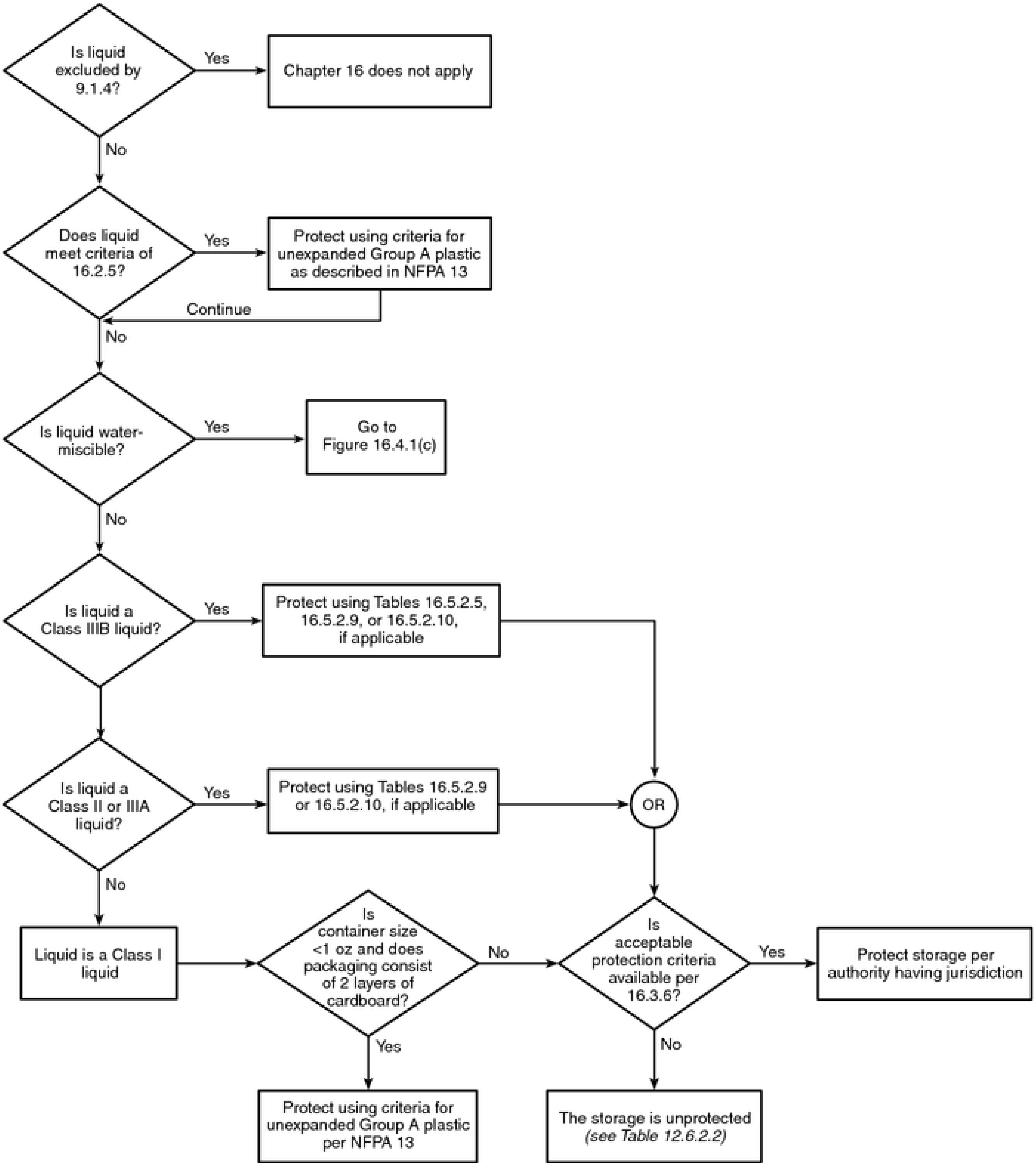
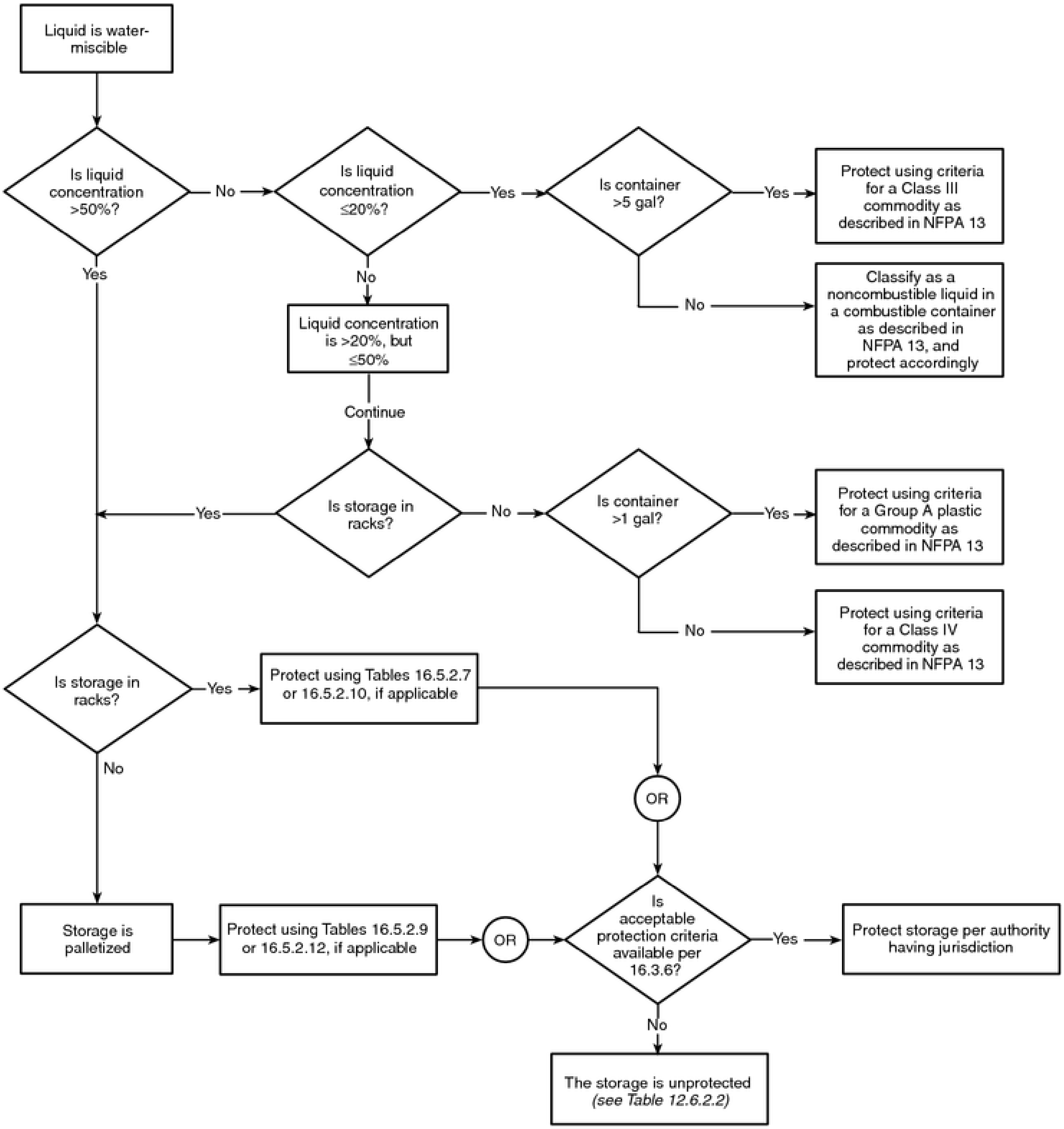


FIGURE 16.4.1(b) Fire Protection Criteria Decision Tree for Nonmiscible Flammable and Combustible

Liquids in Nonmetallic Containers.



Note: For SI units, 1 gal = 3.8 L.

FIGURE 16.4.1(c) Fire Protection Criteria Decision Tree for Miscible Flammable and Combustible Liquids in Nonmetallic Containers.

16.4.1.1 Figure 16.4.1(a) shall be used for miscible and nonmiscible flammable and combustible liquids in metal containers, metal portable tanks, and metal intermediate bulk containers.

16.4.1.2 Figure 16.4.1(b) shall be used for nonmiscible flammable and combustible liquids in nonmetallic containers and in nonmetallic intermediate bulk containers.

16.4.1.3 Figure 16.4.1(c) shall be used for water-miscible flammable and combustible liquids in nonmetallic containers and in nonmetallic intermediate bulk containers.

16.4.2 Automatic sprinkler and foam-water fire protection systems shall be wet pipe, deluge, or preaction systems.

16.4.2.1 If a preaction system is used, it shall be designed so that water or foam solution will immediately discharge from the sprinkler upon sprinkler actuation.

16.4.2.2 A foam-water sprinkler system that meets any of the design criteria specified in the water sprinkler tables in this section shall be acceptable, provided that the system is installed in accordance with NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*.

16.4.3 Water-based fire protection systems shall be inspected, tested, and maintained in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

16.5 Fire Protection System Design Criteria.

16.5.1 General. Subsections 16.5.2.1 through 16.5.2.12 and their related tables, Table 16.5.2.1 through Table 16.5.2.12, shall be used to determine the protection criteria and storage arrangement for the applicable liquid class, container type, and storage configuration, as described in 16.5.2.1 through 16.5.2.12 and subject to the provisions of 16.5.1.

16.5.1.1 Table 16.5.2.1 through Table 16.5.2.12 shall apply only to stable liquids.

16.5.1.2 When foam or foam-water fire protection systems are provided, discharge densities shall be determined based on the listing criteria of the foam discharge devices selected, the foam concentrate, the specific liquids to be protected, and the criteria in the appropriate table in this chapter. Where the discharge densities given in the tables differ from those in the listing criteria for the discharge devices, the greater of the two shall be used.

16.5.1.3 In-rack sprinklers shall be installed in accordance with the provisions of NFPA 13, *Standard for the Installation of Sprinkler Systems*. In addition, the following modifications shall apply:

(1) Alternate lines of in-rack sprinklers shall be staggered vertically in the longitudinal flue space.

(2) Sprinklers in multiple-level in-rack sprinkler systems shall be provided with water shields unless they are separated by horizontal barriers or are specifically listed for installation without water shields.

(3) A vertical clear space of at least 6 in. (150 mm) shall be maintained between the sprinkler deflector and the top of the tier of storage.

(4) Sprinkler discharge shall not be obstructed by horizontal rack structural members.

(5) Where in-rack sprinklers are installed below horizontal barriers, the deflector shall be located a maximum of 7 in. (180 mm) below the barrier.

(6) Longitudinal and transverse flue spaces of at least 6 in. (150 mm) shall be maintained between each rack load.

16.5.1.4 Ceiling sprinklers shall be installed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*, and shall be permitted to have the following maximum head spacing:

(1) Classes I, II, and IIIA liquids: 100 ft^2 (9.3 m^2) per sprinkler

(2) Class IIIB liquids: 120 ft^2 (11.1 m^2) per sprinkler

16.5.1.4.1 Ordinary or intermediate temperature–rated K-25 extended-coverage sprinklers shall be permitted to be used as standard response sprinklers at greater than 144 ft^2 (13 m^2) coverage, with 12 ft (3.7 m) minimum spacing and a maximum coverage area of 196 ft^2 (18 m^2) coverage.

16.5.1.5 The ceiling heights given in Table 16.5.2.1 through Table 16.5.2.12 shall be permitted to be increased by a maximum of 10 percent if an equivalent percent increase in ceiling sprinkler design density is provided.

16.5.1.6 Foam-water sprinkler systems shall be designed and installed in accordance with NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*.

16.5.1.6.1 Foam-water sprinkler systems shall have at least 15 minutes of foam concentrate, based on the required design flow rate.

16.5.1.6.2* Foam-water sprinkler systems shall provide foam solution at the minimum required concentration with as few as four sprinklers flowing.

16.5.1.7 When relieving style containers are used, both ¾ in. (20 mm) and 2 in. (50 mm) listed and labeled pressure-relieving mechanisms are required on containers greater than 6 gal (23 L) capacity.

16.5.1.8 For the purposes of Section 16.5, a rigid nonmetallic intermediate bulk container is one that meets the maximum allowable capacity criteria of Table 9.4.3 and has been listed and labeled in accordance with UL 2368, *Standard for Fire Exposure Testing of Intermediate Bulk Containers for Flammable and Combustible Liquids*, or equivalent.

16.5.1.9 For the purposes of Section 16.5, the following shall apply:

(1) 1 gal = 3.8 L; 1 ft = 0.3 m; 1 ft^2 = 0.09 m^2

(2) 1 gpm/ft^2 is equivalent to 40.7 L/min/m^2 or 40.7 mm/min

(3) A gauge pressure of 1 psi is equivalent to a gauge pressure of 6.9 kPa

(4) SR = standard response sprinkler; QR = quick response sprinkler; ESFR = early suppression fast response sprinkler; (ot) = ordinary temperature

16.5.1.10 For the purposes of Section 16.5, the following shall apply to the in-rack sprinkler design layouts specified in Table 16.5.2.1 through Table 16.5.2.12:

(1) Layout A shall mean one line of in-rack sprinklers 8 ft (2.4 m) above the floor, with sprinklers spaced not

more than 10 ft (3 m) on center. Sprinklers shall be staggered vertically.

(2) Layout B shall mean one line of in-rack sprinklers 6 ft (1.8 m) above the floor and one line of in-rack sprinklers 12 ft (3.6 m) above the floor, with sprinklers spaced not more than 10 ft (3 m) on center. Sprinklers shall be staggered vertically.

(3) Layout C shall mean one line of in-rack sprinklers at every storage level above the floor, with sprinklers spaced not more than 10 ft (3 m) on center. Sprinklers shall be staggered vertically.

(4) Layout D shall mean one line of in-rack sprinklers at every other storage level, beginning above the first storage level, with sprinklers spaced not more than 10 ft (3 m) on center. Sprinklers shall be staggered vertically.

(5) Layout E shall mean one line of in-rack sprinklers in the flue space at every storage level above the floor and face sprinklers at the first storage level at each rack upright. In-rack sprinklers shall be spaced not more than 9 ft (2.7 m) on center and shall be staggered vertically.

(6) Layout F shall mean one line of in-rack sprinklers in the flue space at every other storage level above the first storage level and face sprinklers at the first storage level at each rack upright. In-rack sprinklers shall be spaced not more than 10 ft (3 m) on center and shall be staggered vertically.

(7) Layout G shall be as shown in Figure 16.6.4(a).

(8) Layout H shall be as shown in Figure 16.6.4(d) or Figure 16.6.4(e).

(9) Layout I shall be as shown in Figure 16.6.4(b) or Figure 16.6.4(c).

16.5.1.11 The “Fire Test Ref.” number given for each entry in each of the tables in 16.5.2 shall be used to identify in Section D.2 the information on the fire tests on which the protection criteria for that entry are based.

16.5.2 Specific Design Criteria.

16.5.2.1 Table 16.5.2.1 shall apply to the following:

(1) Automatic sprinkler protection

(2) Single- or double-row rack storage

(3) Nonmiscible liquids and miscible liquids with concentration of flammable or combustible component greater than 50 percent by volume

(4) Metal containers, metal portable tanks, metal intermediate bulk containers

(5) Relieving- or nonrelieving-style containers

Table 16.5.2.1 Design Criteria for Sprinkler Protection of Single- and Double-Row Rack Storage of Liquids i Portable Tanks, and IBCs

	Ceiling Sprinkler Protection		In-Rack Sprinkler Protection
	Sprinkler	Design	Sprinkler

(4) Metal containers, metal portable tanks, metal intermediate bulk containers

(5) Relieving- or nonrelieving-style containers

Table 16.5.2.1 Design Criteria for Sprinkler Protection of Single- and Double-Row Rack Storage of Liquids i Portable Tanks, and IBCs

			Ceiling Sprinkler Protection				In-Rack Sprinkler Protection			
			Sprinkler		Design		Sprinkler			
Container Style and Capacity	**Maximum Storage Height (ft)**	**Maximum Ceiling Height (ft)**	**Type**	**Response**	**Density (gpm/ft^2)**	**Area (ft^2)**	**Type**	**Response**	**Discharge Flow (gpm)**	**Layo**
NONRELIEVING-STYLE CONTAINERS — LIQUID CLASSES IB, IC, II, IIIA										
≤ 1 gal	16	30	K≥11.2	QR 286°F	0.60	2000	K=5.6 or 8.0	QR(ot)	30	A
	20	30	K≥11.2	SR or QR 286°F	0.60	2000	K=5.6 or 8.0	QR(ot)	30	B
≤ 5 gal	25	30	K≥8.0	SR or QR 286°F	0.30	3000	K=5.6 or 8.0	QR(ot)	30	C
>5 and ≤60	25	30	K≥11.2	SR 286°F	0.40	3000	K=5.6 or 8.0	QR or SR (ot)	30	E
NONRELIEVING-STYLE CONTAINERS — LIQUID CLASS IIIB										
≤ 5 gal	40	50	K≥8.0	SR or QR 286°F	0.30	2000	K=5.6 or 8.0	QR(ot)	30	D
>5 and ≤60	40	50	K≥8.0	SR 286°F	0.30	3000	K=5.6 or 8.0	QR(ot)	30	D
RELIEVING-STYLE CONTAINERS — LIQUID CLASSES IB, IC, II, IIIA										
≤ 5 gal	14	18	K≥11.2 pendent only	QR 286°F	0.65	2000	No in-rack sprinklers required			
	25	30	K≥8.0	SR or QR 286°F	0.30	3000	K=5.6 or 8.0	QR(ot)	30	D
>5 and ≤60	25	30	K≥11.2	SR 286°F	0.60	3000	K=5.6 or 8.0	QR(ot)	30	F
Portable tanks and IBCs	25	30	K≥11.2	SR 286°F	0.60	3000	K=5.6 or 8.0	QR or SR (ot)	30	E
RELIEVING-STYLE CONTAINERS — LIQUID CLASS IIIB										
≤ 5 gal	40	50	K≥8.0	SR or QR 286°F	0.30	2000	K=5.6 or 8.0	QR(ot)	30	D
>5 and ≤60	40	50	K≥8.0	SR 286°F	0.30	3000	K=5.6 or 8.0	QR(ot)	30	D
Portable tanks and IBCs	40	50	K≥8.0	SR 286°F	0.30	3000	K=5.6 or 8.0	QR(ot)	30	D

Table 16.5.2.1 Design Criteria for Sprinkler Protection of Single- and Double-Row Rack Storage of Liquids i Portable Tanks, and IBCs

Container Style and Capacity	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Ceiling Sprinkler Protection: Sprinkler Type	Ceiling Sprinkler Protection: Sprinkler Response	Ceiling Sprinkler Protection: Design Density (gpm/ft^2)	Ceiling Sprinkler Protection: Design Area (ft^2)	In-Rack Sprinkler Protection: Sprinkler Type	In-Rack Sprinkler Protection: Sprinkler Response	Discharge Flow (gpm)	Layo

For SI units, 1 gal = 3.8 L, 1 ft = 0.3 m, 1 ft^2 = 0.09 m^2, 1 gpm/ft^2 = 40.7 L/min/m^2 = 40.7 mm/min.

Special Notes:

(1) In-rack sprinkler design based on 6 most hydraulically remote sprinklers in each of upper three levels or on 8 most hydraulically remote sp

(2) Protection for uncartoned or case-cut nonsolid shelf display up to 6.5 ft. (2 m) and storage above in pallets on racking, shelf materials, ope in. (50 mm × 150 mm) wooden slats, spaced a minimum of 2 in. (50 mm) apart.

(3) For K=8.0 and K=11.2 ceiling sprinklers, increase ceiling density to 0.60 if more than one level of storage exists above the top level of in-r

(4) Double-row racks limited to maximum 6 ft (1.8 m) width.

(5) For K=8.0 and K=11.2 ceiling sprinklers, increase ceiling density to 0.60 over 2000 ft^2 if more than one level of storage exists above the to sprinklers.

(6) Reduce in-rack sprinkler spacing to maximum 9 ft (2.7 m) centers.

16.5.2.2 Table 16.5.2.2 shall apply to the following:

(1) Automatic sprinkler protection

(2) Palletized or stacked storage

(3) Nonmiscible liquids and miscible liquids with concentration of flammable or combustible component greater than 50 percent by volume

(4) Metal containers, metal portable tanks, metal intermediate bulk containers

(5) Relieving- or nonrelieving-style containers

Table 16.5.2.2 Design Criteria for Sprinkler Protection of Palletized and Stacked Storage of Liquids in Metal Containers, Portable Tanks, and IBCs

Container Style and Capacity	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Ceiling Sprinkler Protection: Sprinkler Type	Ceiling Sprinkler Protection: Sprinkler Response	Ceiling Sprinkler Protection: Design Density (gpm/ft^2)	Ceiling Sprinkler Protection: Design Area (ft^2)	Special Notes	Fire Test Ref. *[See Table D.2(b)]*
NONRELIEVING-STYLE CONTAINERS — LIQUID CLASSES IB, IC, II, IIIA								
≤ 5 gal	4	18	K≥8.0	SR or QR 286°F	0.21	1500	1	1
	5	18	K≥8.0	SR or QR 286°F	0.30	3000	—	2
	6.5	30	K≥11.2	QR 286°F	0.45	3000	—	3
>5 and ≤60	5	18	K≥11.2	SR 286°F	0.40	3000	—	4

Table 16.5.2.2 Design Criteria for Sprinkler Protection of Palletized and Stacked Storage of Liquids in Metal Containers, Portable Tanks, and IBCs

			Ceiling Sprinkler Protection					
			Sprinkler		Design			
Container Style and Capacity	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Type	Response	Density (gpm/ft^2)	Area (ft^2)	Special Notes	Fire Test Ref. *[See Table D.2(b)]*
NONRELIEVING-STYLE CONTAINERS — LIQUID CLASS IIIB								
≤ 5 gal	18	30	K≥8.0	SR or QR 286°F	0.25	3000	—	5
>5 and ≤60	10	20	K≥8.0	SR 286°F	0.25	3000	—	6
	18	30	K≥8.0	SR 286°F	0.35	3000	—	7
RELIEVING-STYLE CONTAINERS — LIQUID CLASSES IB, IC, II, IIIA								
≤ 5 gal	12	30	K≥11.2 pendent only	QR 286°F	0.60	3000	2	8
>5 and ≤60	5	30	K≥11.2	SR 286°F	0.40	3000	—	9
	6.5	30	K≥11.2	SR 286°F	0.60	3000	3	10
Portable tanks	1-high	30	K≥8.0	SR 286°F	0.30	3000	—	14
and IBCs	2-high	30	K≥11.2	SR 286°F	0.60	3000	—	15
RELIEVING-STYLE CONTAINERS — LIQUID CLASS IIIB								
≤ 5 gal	18	30	K≥8.0	SR or QR 286°F	0.25	3000	—	11
>5 and ≤60	10	20	K≥8.0	SR 286°F	0.25	3000	—	12
	18	30	K≥8.0	SR 286°F	0.35	3000	—	13
Portable tanks	1-high	30	K≥8.0	SR 286°F	0.25	3000	—	16
and IBCs	2-high	30	K≥11.2	SR 286°F	0.50	3000	—	17

For SI units, 1 gal = 3.8 L, 1 ft = 0.3 m, 1 ft^2 = 0.09 m^2, 1 gpm/ft^2 = 40.7 L/min/m^2 = 40.7 mm/min.
Special Notes:
(1) Minimum hose stream demand can be reduced to 250 gpm for 2 hours.
(2) Sprinklers must also be hydraulically calculated to provide a density of 0.80 gpm/ft^2 over 1000 ft^2.
(3) Drums must be placed on open slatted pallet, not nested, to allow pressure relief from drums on lower levels.

16.5.2.3 Table 16.5.2.3 shall apply to the following:

(1) Foam water sprinkler protection

(2) Single- or double-row rack storage

(3) Nonmiscible liquids and miscible liquids with concentration of flammable or combustible component greater than 50 percent by volume

(4) Metal containers, metal portable tanks, metal intermediate bulk containers

(5) Relieving- or nonrelieving-style containers

Table 16.5.2.3 Design Criteria for Foam-Water Sprinkler Protection of Single- or Double-Row Rack Storage Containers, Portable Tanks, and IBCs

			Ceiling Sprinkler Protection				In-Rack Sprinkler Protection			
			Sprinkler		Design		Sprinkler			
Container Style and Capacity	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Type	Response	Density (gpm/ft²)	Area (ft²)	Type	Response	Discharge Flow (gpm)	Lay
NONRELIEVING-STYLE CONTAINERS — LIQUID CLASSES IB, IC, II, IIIA										
≤ 5 gal	25	30	K≥8.0	SR or QR 286°F	0.30	2000	K=5.6 or 8.0	QR or SR (ot)	30	(
>5 and ≤60	25	30	K≥8.0	SR 286°F	0.30	3000	K=5.6 or 8.0	QR or SR (ot)	30	(
NONRELIEVING-STYLE CONTAINERS — LIQUID CLASS IIIB										
≤ 60 gal	40	50	K≥8.0	SR 286°F	0.30	2000	K=5.6 or 8.0	QR or SR (ot)	30	I
RELIEVING-STYLE CONTAINERS — LIQUID CLASSES IB, IC, II, IIIA										
≤ 5 gal	25	30	K≥8.0	SR or QR 286°F	0.30	2000	K=5.6 or 8.0	QR or SR (ot)	30	I
>5 and ≤ 60, portable tanks and IBCs	25	30	K≥8.0	SR 286°F	0.30	3000	K=5.6 or 8.0		30	I
RELIEVING-STYLE CONTAINERS — LIQUID CLASS IIIB										
≤ 60 gal	40	50	K≥8.0	SR 286°F	0.30	2000	K = 5.6 or 8.0	QR or SR (ot)	30	I

For SI units, 1 gal = 3.8 L, 1 ft = 0.3 m, 1 ft^2 = 0.09 m^2, 1 gpm/ft^2 = 40.7 L/min/m^2 = 40.7 mm/min.

Special Notes:

(1) In-rack sprinkler design based on 6 most hydraulically remote sprinklers in each of upper three levels.

(2) Design area can be reduced to 1500 ft^2 when using a pre-primed foam-water system installed in accordance with NFPA 16, *Standard for th Foam-Water Sprinkler and Foam-Water Spray Systems*, and maintained according to NFPA 25, *Standard for the Inspection, Testing, and Mai Fire Protection Systems*.

(3) Design area can be reduced to 2000 ft^2 when using a pre-primed foam-water system installed in accordance with NFPA 16 and maintained

(4) In-rack sprinkler hydraulic design can be reduced to three sprinklers operating per level, with three levels operating simultaneously, when u foam-water sprinkler system designed in accordance with NFPA 16 and maintained in accordance with NFPA 25.

(5) Double-row racks limited to maximum 6 ft (1.8 m) width.

(6) For K=8.0 and K=11.2 ceiling sprinklers, increase ceiling density to 0.60 over 2000 ft^2 if more than one level of storage exists above the to sprinklers.

(7) Reduce in-rack sprinkler spacing to maximum 9 ft (2.7 m) centers.

16.5.2.4 Table 16.5.2.4 shall apply to the following:

(1) Foam water sprinkler protection

(2) Palletized or stacked storage

(3) Nonmiscible liquids and miscible liquids with concentration of flammable or combustible component greater than 50 percent by volume

(4) Metal containers, metal portable tanks, metal intermediate bulk containers

(5) Relieving- or nonrelieving-style containers

Table 16.5.2.4 Design Criteria for Foam-Water Sprinkler Protection of Palletized and Stacked Storage of Liquid Metal Containers, Portable Tanks, and IBCs

Container Style and Capacity	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Ceiling Sprinkler Protection: Sprinkler: Type	Response	Design: Density (gpm/ft^2)	Area (ft^2)	Special Notes	Fire Test [See Tal D.2(d)
NONRELIEVING-STYLE CONTAINERS — LIQUID CLASSES IB, IC, II, IIIA								
≤ 5 gal, cartoned	11	30	K≥11.2	SR or QR 286°F	0.40	3000	1	1
≤ 5 gal, uncartoned	12	30	K≥8.0	SR or QR 286°F	0.30	3000	1	2
>5 and ≤60	5 (1-high)	30	K≥8.0	SR 286°F	0.30	3000	1	3
RELIEVING-STYLE CONTAINERS — LIQUID CLASSES IB, IC, II, IIIA								
>5 and ≤60	6.5 (2-high)	30	K≥8.0	SR 286°F	0.30	3000	2, 3	4
	10 (3-high)	33	K≥11.2	SR 286°F	0.45	3000	2, 3	6
	13.75 (4-high)	33	K≥11.2	SR 286°F	0.60	3000	2, 3	7
Portable tanks and IBCs	1- or 2-high	30	K≥8.0	SR 286°F	0.30	3000	3	5

For SI units, 1 gal = 3.8 L, 1 ft = 0.3 m, 1 ft^2 = 0.09 m^2, 1 gpm/ft^2 = 40.7 L/min/m^2 = 40.7 mm/min.

Special Notes:

(1) Design area can be reduced to 2000 ft^2 when using a pre-primed foam-water system installed in accordance with NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*, and maintained according to NFPA 25, *Standard for the Inspection Testing, and Maintenance of Water-Based Fire Protection Systems*.

(2) Both ¾ in. (20 mm) and 2 in. (50 mm) listed pressure-relieving mechanisms are required on containers greater than 6 gal (23 L) capacity.

(3) Drums placed on open slatted pallet, not nested, to allow pressure relief from drums on lower levels.

16.5.2.5 Table 16.5.2.5 shall apply to the following:

(1) Automatic sprinkler protection

(2) Single-, double-, or multiple-row rack storage

(3) Class IIIB nonmiscible liquids and Class IIIB miscible liquids with concentration of flammable or

combustible component greater than 50 percent by volume

(4) Nonmetallic containers or intermediate bulk containers

(5) Cartoned or uncartoned

Table 16.5.2.5 Design Criteria for Sprinkler Protection of Single-, Double-, and Multiple-Row Rack Storage of

Closed-Cup Flash Point (°F)	Container or IBC Capacity (gal)	Packaging	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Minimum Aisle Width (ft)	Rack Width (ft)	Sprinkler Protect: Ceiling Sprinkler Type	De
≥200	≤5	Plastic containers, cartoned or uncartoned	Unlimited	Unlimited	4	Any	Any	See 16.6.1 Protection Design Sc
≥375	≤275	Flexible plastic liner within a composite continuously-wound corrugated paperboard intermediate bulk container (See Special Note 1)	28	30	8	Any	Any	See 16.6.3 Protection Design Sc
≥375	≤6	Flexible plastic liner within a composite corrugated paperboard box	Unlimited	Unlimited	8	Any	Any	See 16.6.3 Protection Design Sc

For SI units, 1 gal = 3.8 L, 1 ft = 0.3 m.
Special Notes:
(1) Construction of intermediate bulk container to be a minimum of 8 layers of paperboard, with a minimum nominal thickness of 1½ in. (38 m
side panel.

16.5.2.6 Table 16.5.2.6 shall apply to the following:

(1) Automatic sprinkler protection

(2) Shelf storage

(3) Nonmiscible liquids and miscible liquids with concentration of flammable or combustible component greater than 50 percent by volume

(4) Nonrelieving-style metal containers

Table 16.5.2.6 Design Criteria for Sprinkler Protection of Shelf Storage of Liquids in Metal Containers

Ceiling Sprinkler Protection	
Sprinkler	Design

(3) Nonmiscible liquids and miscible liquids with concentration of flammable or combustible component greater than 50 percent by volume

(4) Nonrelieving-style metal containers

Table 16.5.2.6 Design Criteria for Sprinkler Protection of Shelf Storage of Liquids in Metal Containers

			Ceiling Sprinkler Protection					
			Sprinkler		Design			
Container Style and Capacity	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Type	Response	Density (gpm/ft^2)	Area (ft^2)	Special Notes	Fire Test Ref. *[See Table D.2(f)]*
≤ 1 gal nonrelieving style	6	18	K≥8.0	SR or QR 286°F	0.19	1500	1, 2	1

For SI units, 1 gal = 3.8 L, 1 ft = 0.3 m, 1 ft^2 = 0.09 m^2, 1 gpm/ft^2 = 40.7 L/min/m^2 = 40.7 mm/min.
Special Notes:
(1) Protection limited to mercantile shelving that is 2 ft (600 mm) or less in depth per side, with backing between each side.
(2) Minimum hose stream demand can be reduced to 250 gpm for 2 hours.

16.5.2.7 Table 16.5.2.7 shall apply to the following:

(1) Automatic sprinkler protection

(2) Single- or double-row rack storage

(3) Water-miscible liquids with concentration of flammable or combustible component greater than 50 percent by volume

(4) Plastic containers

(5) Cartoned or uncartoned

(6) Minimum 8 ft (2.4 m) aisle width

Table 16.5.2.7 Design Criteria for Sprinkler Protection of Single- and Double-Row Rack Storage of Liquids in Plastic Containers

			Ceiling Sprinkler Protection			
Container Style and Capacity	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Ceiling Sprinkler Protection	In-Rack Sprinklers	Special Notes	Fire Test Ref. *[See Table D.2(g)]*
16 oz, cartoned	Unlimited	Unlimited	See 16.6.1, Fire Protection System Design Scheme “A”	See 16.6.1, Fire Protection System Design Scheme “A”	1, 2	3

Table 16.5.2.7 Design Criteria for Sprinkler Protection of Single- and Double-Row Rack Storage of Liquids in Plastic Containers

Container Style and Capacity	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Ceiling Sprinkler Protection: Ceiling Sprinkler Protection	Ceiling Sprinkler Protection: In-Rack Sprinklers	Special Notes	Fire Test Ref. *[See Table D.2(g)]*
≤ 1 gal, cartoned	Unlimited	Unlimited	See 16.6.2, Fire Protection System Design Scheme “B”	See 16.6.2, Fire Protection System Design Scheme “B”	1, 2	1
≤ 60 gal, cartoned or uncartoned	25	30	See 16.6.2, Fire Protection System Design Scheme “B”	See 16.6.2, Fire Protection System Design Scheme “B”	1, 2	2

For SI units, 1 gal = 3.8 L, 1 ft = 0.3 m.
Special Notes:
(1) Minimum aisle width in all cases is 8 ft (2.4 m).
(2) Maximum rack width in all cases is 9 ft (2.7 m).

16.5.2.8 Table 16.5.2.8 shall apply to the following:

(1) Automatic sprinkler protection

(2) Single- or double-row rack storage or palletized storage

(3) Nonmiscible liquids and miscible liquids with concentration of flammable or combustible component greater than 50 percent by volume

(4) Relieving-style metal containers

Table 16.5.2.8 Design Criteria for Single-Row Rack, Double-Row Rack, and Palletized Storage of Liquids in R Metal Containers

Container Style and Capacity	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Ceiling Sprinkler Protection: Sprinkler Type	Ceiling Sprinkler Protection: Design (Number of sprinklers @ stated pressure)	In-Rack Sprinkler Protection: Sprinkler: Type	In-Rack Sprinkler Protection: Sprinkler: Response	In-Rack Sprinkler Protection: End Sprinkler Design Pressure	In-Rack Sprinkler Protection: Layout	Sp N
LIQUID CLASSES IB, IC, II, IIIA, IIIB									
RACK STORAGE with MAXIMUM 6 ft RACK WIDTH and MINIMUM 7.5 ft AISLE WIDTH									
≤5 gal, cartoned or uncartoned	14	24	Pendent ESFR K≥14.0	12 @ 50 psi	K = 11.2	QR (ot)	10 psi	G	1, 2 5
	14	24	Pendent ESFR K≥25.0	12 @ 25 psi	No in-rack sprinklers required				2, 3,

Table 16.5.2.8 Design Criteria for Single-Row Rack, Double-Row Rack, and Palletized Storage of Liquids in R Metal Containers

Container Style and Capacity	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Ceiling Sprinkler Protection: Sprinkler Type	Ceiling Sprinkler Protection: Design (Number of sprinklers @ stated pressure)	In-Rack Sprinkler Protection: Sprinkler: Type	In-Rack Sprinkler Protection: Sprinkler: Response	In-Rack Sprinkler Protection: End Sprinkler Design Pressure	In-Rack Sprinkler Protection: Layout	Sp N
LIQUID CLASSES IB, IC, II, IIIA, IIIB RACK STORAGE with MAXIMUM 9 ft RACK WIDTH and 8 ft MINIMUM AISLE WIDTH									
≤1 gal, cartoned only	20	30	Pendent ESFR K≥14.0 (ot)	12 @ 75 psi	No in-rack sprinklers required				-
≤1 gal, cartoned only	25	30	Pendent ESFR K≥14.0 (ot)	12 @ 50 psi	K = 8.0	QR (ot)	15 psi	H	1
≤5 gal, cartoned or uncartoned	25	30	Pendent ESFR K≥14.0 (ot)	12 @ 75 psi	K = 8.0	QR (ot)	30 psi	I	1
LIQUID CLASSES IB, IC, II, IIIA, IIIB PALLETIZED STORAGE with MINIMUM 7.5 ft AISLE WIDTH									
≤1 gal, cartoned only	8	30	Pendent ESFR K≥14.0 (ot)	12 @ 50 psi	—	—	—	—	-
≤5 gal, cartoned or uncartoned	12	30	Pendent ESFR K≥14.0 (ot)	12 @ 75 psi	—	—	—	—	-

For SI units, 1 gal = 3.8 L, 1 ft = 0.3 m, 1 psi = 6.9 kPa.

Special Notes:

(1) The in-rack sprinkler water demand shall be based on the simultaneous operation of the most hydraulically remote sprinklers as follows:

(a) Seven sprinklers where only one level of in-rack sprinklers is installed.

(b) Fourteen sprinklers (seven on each of the two top levels) where more than one level of in-rack sprinklers is installed.

(2) The in-rack sprinkler water demand should be balanced with the ceiling sprinkler water demand at their point of connection.

(3) One-gallon and 1-quart containers are not required to be relieving style.

(4) Provide minimum 3 in. transverse flue at rack uprights.

(5) For Class IIIB liquids, see also Table 16.5.2.5.

(6) Racks can have open-mesh wire intermediate shelving on lower levels.

16.5.2.9 Table 16.5.2.9 shall apply to the following:

(1) Automatic sprinkler protection

(2) Palletized storage

(3) Class II and Class III nonmiscible and Class II and Class III miscible liquids

(4) Rigid nonmetallic intermediate bulk containers

Table 16.5.2.9 Design Criteria for Sprinkler Protection of Palletized Storage of Class II and Class III Liquids i

(1) Automatic sprinkler protection

(2) Palletized storage

(3) Class II and Class III nonmiscible and Class II and Class III miscible liquids

(4) Rigid nonmetallic intermediate bulk containers

Table 16.5.2.9 Design Criteria for Sprinkler Protection of Palletized Storage of Class II and Class III Liquids in Rigid Nonmetallic IBCs

			Ceiling Sprinkler Protection					
			Sprinkler		Design			
Maximum Capacity (gal)	**Maximum Storage Height**	**Maximum Ceiling Height (ft)**	**Type**	**Response**	**Density (gpm/ft^2)**	**Area (ft^2)**	**Special Notes**	**Fire Test R** ***[See Tabl D.2(i)]***
793	1-high	30	K ≥ 11.2	SR, high temperature	0.45	3000	1, 2, 4	1
793	2-high	30	K ≥ 11.2	SR, high temperature	0.60	3000	1, 2, 3, 4	2

For SI units, 1 gal = 3.8 L, 1 ft = 0.3 m, 1 ft^2 = 0.9 m^2, 1 gpm/ft^2 = 40.7 L/min/m^2 = 40.7 mm/min.

Special Notes:

(1) Foam-water sprinkler protection shall be permitted to be substituted for water sprinkler protection, provided the same design criteria are used.

(2) Rigid nonmetallic intermediate bulk containers shall be listed and labeled in accordance with UL 2368, *Standard for Fire Exposure Testing of Intermediate Bulk Containers for Flammable and Combustible Liquids*, or an equivalent test procedure.

(3) The sprinkler operating gauge pressure shall be a minimum 30 psi (207 kPa).

(4) See also Section E.1.

16.5.2.10 Table 16.5.2.10 shall apply to the following:

(1) Automatic sprinkler protection

(2) Single- or double-row rack storage

(3) Class II and Class III nonmiscible and Class II and Class III miscible liquids

(4) Rigid nonmetallic intermediate bulk containers

Table 16.5.2.10 Design Criteria for Sprinkler Protection of Single- and Double-Row Rack Storage of Class II and Class III Liquids in Rigid Nonmetallic IBCs

			Ceiling Sprinkler Protection			
Maximum Capacity (gal)	**Maximum Storage Height (ft)**	**Maximum Ceiling Height (ft)**	**Sprinkler Type**	**Design**	**Special Notes**	**Fire Test Ref. *[See Table D.2(j)]***
793	25	30	Standard spray	See 16.6.2, Fire Protection System Design Scheme "B"	1, 2, 3, 4	1

For SI units, 1 gal = 3.8 L, 1 ft = 0.3 m.

Special Notes:

(1) Rigid nonmetallic intermediate bulk containers are listed and labeled in accordance with UL 2368, *Standard for Fire Exposure Testing of Intermediate Bulk Containers for Flammable and Combustible Liquids*, or an equivalent test procedure.

(2) Maximum rack width is 9 ft (2.7 m).

(3) Minimum aisle width is 8 ft (2.4 m).

(4) See also Section E.1.

16.5.2.11 Table 16.5.2.11 shall apply to the following:

(1) Automatic sprinkler protection

(2) Palletized or stacked storage

(3) Unsaturated polyester resins (UPRs) with not more than 50 percent by weight of Class IC, II, or IIIA liquid

(4) Metal containers; nonrelieving style allowed only up to 6 gal (23 L)

Table 16.5.2.11 Design Criteria for Sprinkler Protection of Palletized or Stacked Storage of Unsaturated Polyester Resins in Metal Containers

			Ceiling Sprinkler Protection					
			Sprinkler		Design			
Capacity (gal)	**Maximum Storage Height (ft)**	**Maximum Ceiling Height (ft)**	**Type**	**Response**	**Density (gpm/ft^2)**	**Area (ft^2)**	**Special Notes**	**Fire Test Ref. *[See Table D.2(k)]***

Table 16.5.2.11 Design Criteria for Sprinkler Protection of Palletized or Stacked Storage of Unsaturated Polyester Resins in Metal Containers

Capacity (gal)	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Ceiling Sprinkler Protection: Sprinkler Type	Ceiling Sprinkler Protection: Sprinkler Response	Ceiling Sprinkler Protection: Design Density (gpm/ft^2)	Ceiling Sprinkler Protection: Design Area (ft^2)	Special Notes	Fire Test Ref. *[See Table D.2(k)]*
>5 and <60	10	33	K≥11.2	SR, ordinary temperature or high temperature	0.45	3000	1, 2, 3	1

For SI units, 1 gal = 3.8 L, 1 ft = 0.3 m, 1 ft^2 = 0.09 m^2, 1 gpm/ft^2 = 40.7 $L/min/m^2$ = 40.7 mm/min.

Special Notes:

(1) Drums placed on open, slatted pallet, not nested, to allow pressure relief from drums on lower levels.

(2) Storage areas containing unsaturated polyester resin (UPR) should not be located in the same spill containment area or drainage path of other Class I or Class II liquids, unless protected as required for such other liquids.

(3) Both ¾ in. (20 mm) and 2 in. (50 mm) listed and labeled pressure-relieving devices are required on containers that exceed 6 gal (23 L) capacity.

16.5.2.12 Table 16.5.2.12 shall apply to the following:

(1) Automatic sprinkler protection

(2) Palletized or stacked storage

(3) Miscible liquids with concentration of flammable or combustible components no greater than 80 percent by volume

(4) Glass or plastic containers

Table 16.5.2.12 Design Criteria for Sprinkler Protection of Palletized or Stacked Storage of Miscible Liquids in Glass or Plastic Containers

Container Style and Capacity	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Ceiling Sprinkler Protection: Sprinkler Type	Ceiling Sprinkler Protection: Sprinkler Response	Ceiling Sprinkler Protection: Design Density (gpm/ft^2)	Ceiling Sprinkler Protection: Design Area (ft^2)	Special Notes	Fire Test Ref. *[See Table Annex D.2(l)]*
≤ 8 oz	5	38	K ≥ 11.2	QR 155°F	0.47	2000	—	S61

For SI units, 1 gal = 3.8 L, 1 ft = 0.3 m, 1 ft^2 = 0.09 m^2, 1 gpm/ft^2 = 40.7 $L/min/m^2$ = 40.7 mm/min.

16.6 Fire Protection System Design Schemes.

16.6.1 Fire Protection System Design Scheme "A."

16.6.1.1 Horizontal barriers of plywood having a minimum thickness of ⅜ in. (10 mm) or of sheet metal of minimum 22 gauge thickness shall be installed in accordance with Figure 16.6.1.1(a), Figure 16.6.1.1(b), or Figure 16.6.1.1(c), whichever is applicable. All liquid storage shall be located beneath a barrier. *[See also 16.6.1.9 for liquids with flash points equal to or greater than 450°F (230°C).]*

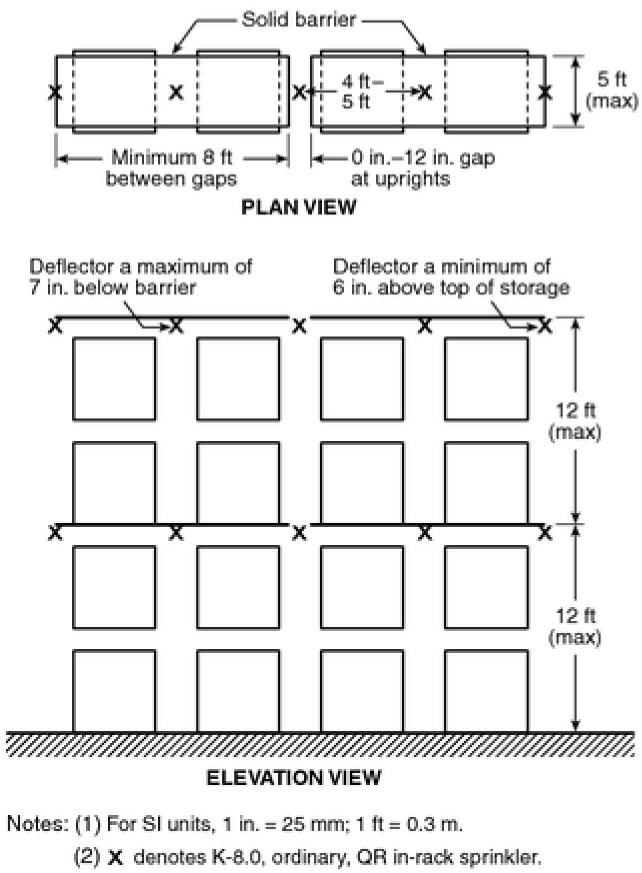
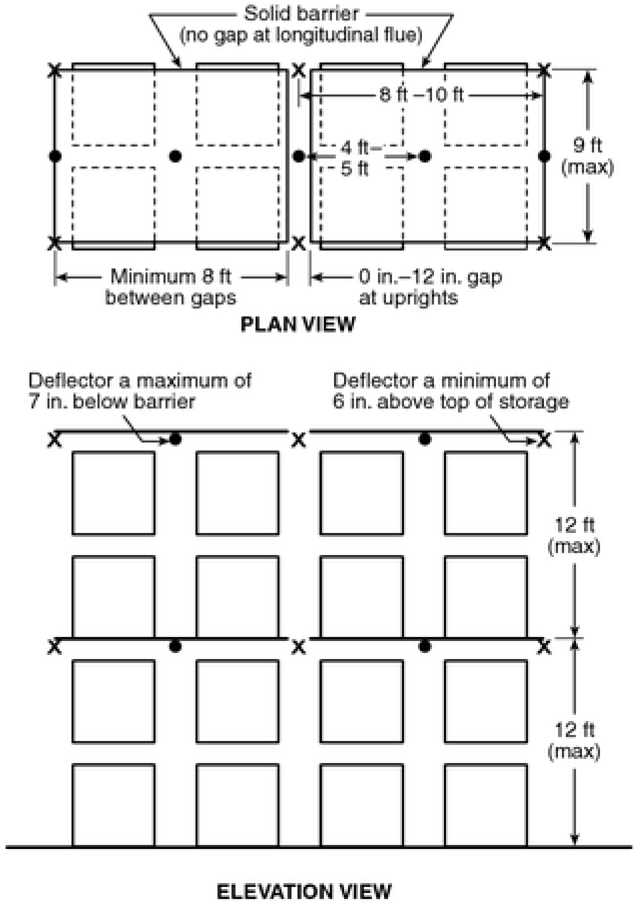


FIGURE 16.6.1.1(a) Single-Row Rack Sprinkler Layout for Design Scheme "A."



Notes: (1) For SI units, 1 in. = 25 mm; 1 ft = 0.3 m.
(2) ● denotes K-8.0, ordinary, QR longitudinal flue sprinkler.
(3) x denotes K-8.0, ordinary, QR face sprinkler.

FIGURE 16.6.1.1(b) Double-Row Rack Sprinkler Layout for Design Scheme "A."

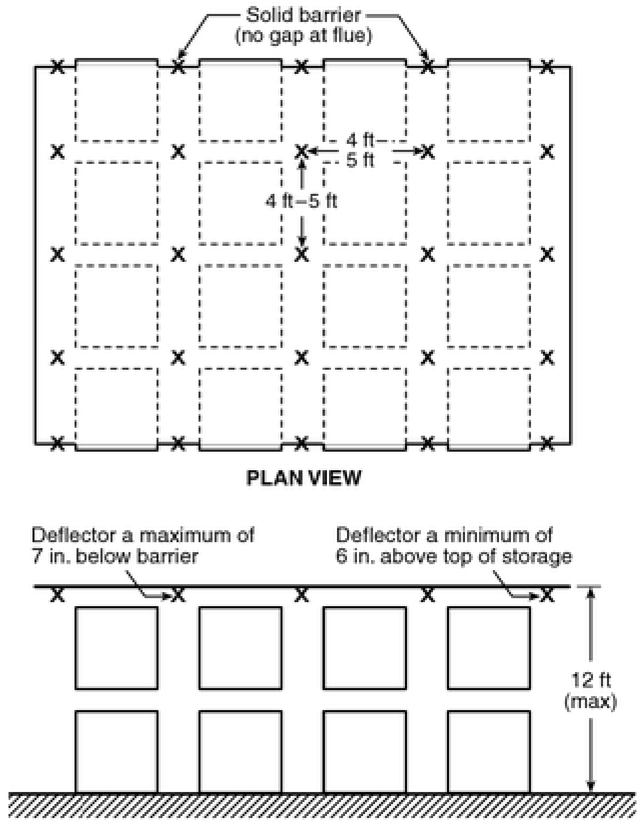


FIGURE 16.6.1.1(c) Multiple-Row Rack Sprinkler Layout for Design Scheme "A."

16.6.1.2 In-rack sprinklers shall be installed in accordance with Figure 16.6.1.1(a), Figure 16.6.1.1(b), or Figure 16.6.1.1(c), whichever is applicable.

16.6.1.3 Vertical barriers shall not be provided between in-rack sprinklers.

16.6.1.4 In-rack sprinklers shall meet the following requirements:

(1) In-rack sprinklers shall be nominal K=8.0, ordinary temperature–rated quick-response sprinklers.

(2) In-rack sprinklers shall be installed below each barrier level.

(3) In-rack sprinklers shall provide a minimum end operating pressure (gauge pressure) of 50 psi (345 kPa) out of the hydraulically most remote six sprinklers (three on two lines), if one barrier level is provided, or the hydraulically most remote eight sprinklers (four on two lines), if two or more barrier levels are provided.

16.6.1.5 If there are adjacent rack bays that are not dedicated to storage of liquids, the barrier and in-rack sprinkler protection shall be extended at least 8 ft (2.4 m) beyond the area devoted to liquid storage. In addition, adjacent racks across the aisles on each side of the liquid storage shall be protected in accordance with 16.6.1.

16.6.1.6 Ceiling sprinkler demand shall not be included in the hydraulic calculations for in-rack sprinklers.

16.6.1.7 Water demand at point of supply shall be calculated separately for in-rack and ceiling sprinklers and shall be based on the greater demand.

16.6.1.8 Ceiling sprinklers shall meet the following requirements:

(1) Ceiling sprinkler protection shall be designed to protect the surrounding occupancy.

(2) Any sprinkler type shall be acceptable.

(3) If standard spray sprinklers are used, they shall be capable of providing not less than 0.20 gpm/ft^2 over 3000 ft^2 (8 mm/min over 270 m^2).

(4) If the liquid storage does not extend to the full height of the rack, protection for commodities stored above the top horizontal barrier shall meet the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems*, for the commodities stored, based on the full height of the rack.

16.6.1.9 Barriers shall not be required for liquids with closed-cup flash points of 450°F (230°C) or greater. If barriers are omitted, the following shall apply:

(1) Ceiling sprinkler protection shall provide a minimum density of 0.3 gpm/ft^2 over the most hydraulically remote 2000 ft^2 (12 mm/min over 180 m^2) using ordinary temperature, standard-response sprinklers with a nominal K-factor equal to or greater than 8.0.

(2) The ceiling sprinkler water demand and the in-rack water demand shall be balanced at their point of connection.

(3) The sprinklers located at the rack face shall be staggered vertically.

16.6.1.10 A 500 gpm (1900 L/min) hose stream allowance shall be provided.

16.6.2 Fire Protection System Design Scheme "B."

16.6.2.1 Horizontal barriers of plywood having a minimum thickness of $\frac{3}{8}$ in. (10 mm) or of sheet metal of minimum 22 gauge thickness shall be installed in accordance with Figure 16.6.2.1(a), Figure 16.6.2.1(b), or Figure 16.6.2.1(c), whichever is applicable. All liquid storage shall be located beneath a barrier.

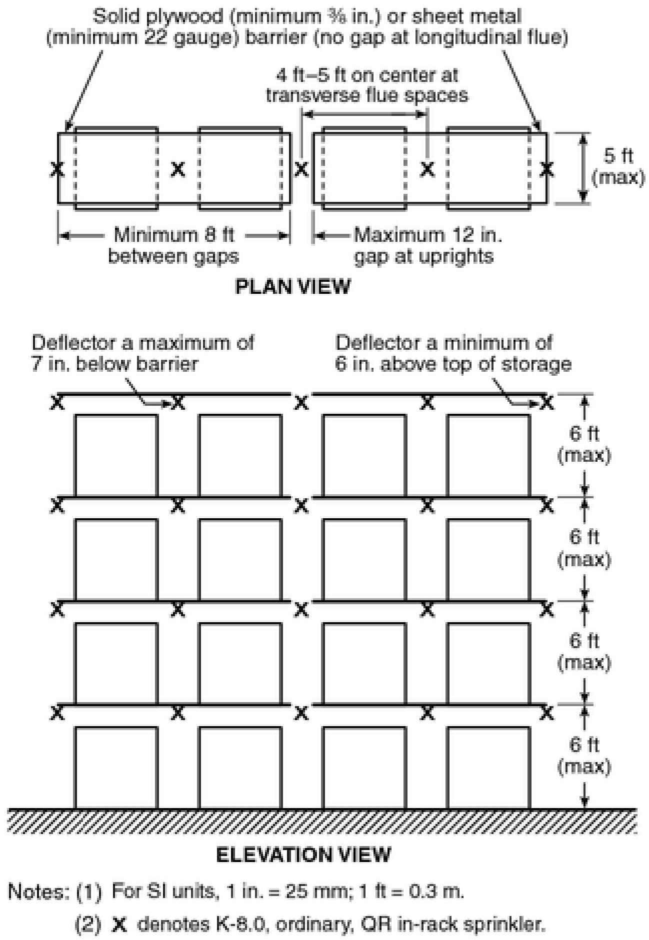


FIGURE 16.6.2.1(a) Single-Row Rack Sprinkler Layout for Design Scheme "B" — Sprinklers in Center of Rack.

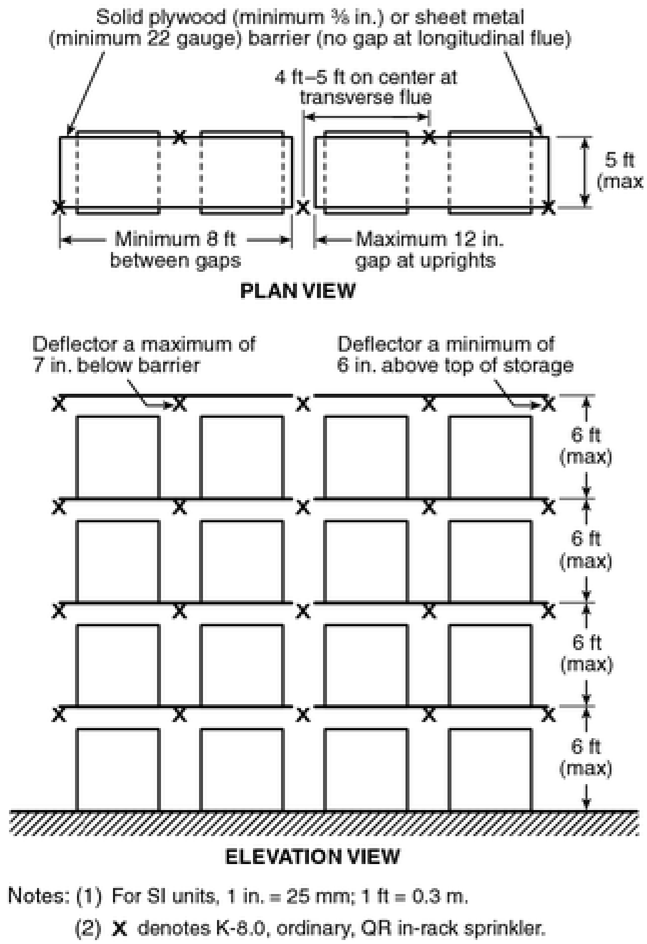


FIGURE 16.6.2.1(b) Double-Row Rack Sprinkler Layout for Design Scheme "B" — Sprinklers on Face of Rack.

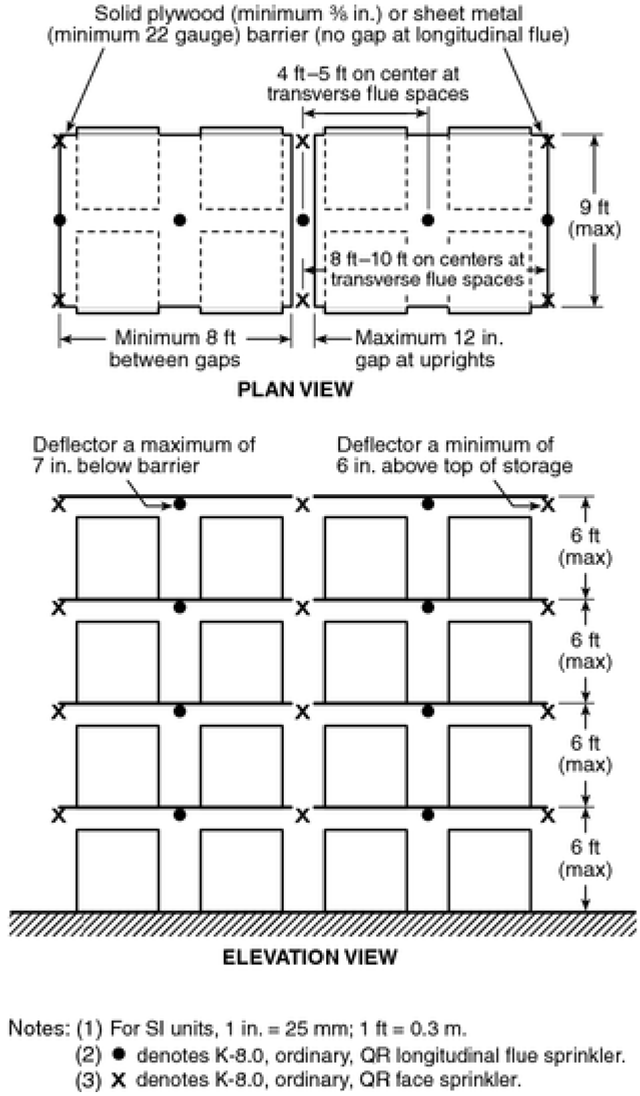


FIGURE 16.6.2.1(c) Double-Row Rack Sprinkler Layout for Design Scheme "B."

16.6.2.2 In-rack sprinklers shall be installed in accordance with Figure 16.6.2.1(a), Figure 16.6.2.1(b), or Figure 16.6.2.1(c), whichever is applicable.

16.6.2.3 Vertical barriers shall not be provided between in-rack sprinklers.

16.6.2.4 In-rack sprinklers shall meet the following requirements:

(1) In-rack sprinklers shall be nominal K=8.0, ordinary temperature–rated quick-response sprinklers.

(2) In-rack sprinklers shall be installed below each barrier level.

(3) For containers that do not exceed 60 gal (230 L) capacity and where there is only one horizontal barrier, in-rack sprinklers shall provide a minimum end operating pressure (gauge pressure) of 50 psi (345 kPa) out of the hydraulically most remote six sprinklers (three on two lines), if one barrier level is provided, or the

hydraulically most remote eight sprinklers (four on two lines), if two or more barrier levels are provided.

(4) For containers that exceed 60 gal (230 L) capacity, but do not exceed 793 gal (3000 L), in-rack sprinklers shall provide a minimum operating pressure (gauge pressure) of 50 psi (345 kPa) from the hydraulically most remote 12 sprinklers, six each on two lines.

16.6.2.5 If there are adjacent rack bays that are not dedicated to storage of liquids, the barrier and in-rack sprinkler protection shall be extended beyond the area devoted to liquid storage as follows:

(1) For containers that do not exceed 1 gal (3.8 L) capacity, protection shall be extended at least 8 ft (2.4 m) beyond the area devoted to liquid storage. In addition, adjacent racks across the aisles on each side of the liquid storage shall be protected in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems,* for the commodity stored.

(2) For containers that exceed 1 gal (3.8 L) capacity, but do not exceed 793 gal (3000 L), protection shall be extended at least 8 ft (2.4 m) beyond the area devoted to liquid storage. In addition, protection shall be extended to protect adjacent racks across the aisles on each side of the liquid storage.

16.6.2.6 Ceiling sprinklers for containers that do not exceed 1 gal (3.8 L) capacity shall meet the following requirements:

(1) Ceiling sprinklers shall be designed to protect the surrounding occupancy.

(2) Ceiling sprinkler water demand shall not be included in the hydraulic calculations for the in-rack sprinkler protection.

(3) Water demand at the point of supply shall be calculated separately for in-rack and ceiling sprinklers and shall be based on the greater of the two.

(4) Any sprinkler type shall be acceptable for the ceiling sprinkler protection.

(5) If standard spray sprinklers are used, they shall be capable of providing not less than 0.20 gpm/ft^2 over 3000 ft^2 (8 L/min over 270 m^2).

(6) If the liquid storage does not extend to the full height of the rack, protection for commodities stored above the top horizontal barrier shall meet the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems,* for the commodities stored, based on the full height of the rack.

16.6.2.7 Ceiling sprinklers for containers that exceed 1 gal (3.8 L) capacity, but do not exceed 60 gal (230 L), shall meet the following requirements:

(1) Ceiling sprinkler protection shall provide a minimum density of 0.45 gpm/ft^2 (18.3 mm/min) over the most hydraulically remote 3000 ft^2 (270 m^2), using high-temperature, standard-response sprinklers of nominal K-factor of 11.2 or greater. Other types of sprinklers shall not be used.

(2) Ceiling sprinkler water demand and the in-rack sprinkler demand shall be balanced at the point of connection.

16.6.2.8 Ceiling sprinklers for containers that exceed 60 gal (230 L) capacity, but do not exceed 793 gal (3000 L), shall meet the following requirements:

(1) Ceiling sprinklers shall be designed to provide a minimum density of 0.60 gpm/ft^2 over 3000 ft^2 (24 mm/min

over the most remote 270 m²), using high-temperature-rated, standard-response sprinklers of nominal K-factor of 11.2 or greater. Other types of sprinklers shall not be used.

(2) Ceiling sprinkler water demand and the in-rack sprinkler demand shall be balanced at the point of connection.

16.6.2.9 A 500 gpm (1900 L/min) hose stream allowance shall be provided.

16.6.3 Fire Protection System Design Scheme "C."

16.6.3.1 Horizontal barriers of plywood having a minimum thickness of ⅜ in. (10 mm) or of sheet metal of minimum 22 gauge thickness shall be installed in accordance with Figure 16.6.3.1(a), Figure 16.6.3.1(b), or Figure 16.6.3.1(c), whichever is applicable. All liquid storage shall be located beneath a barrier.

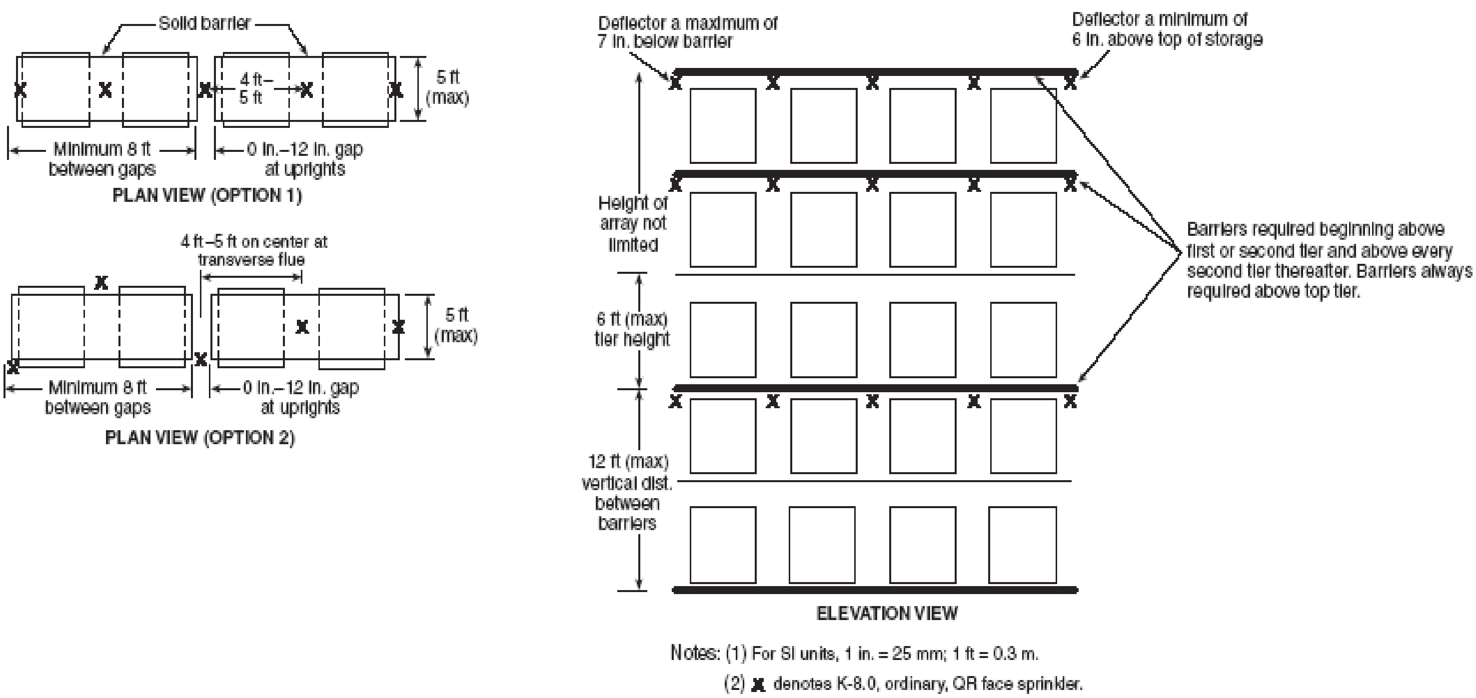


FIGURE 16.6.3.1(a) Single-Row Rack Sprinkler Layout for Design Scheme "C."

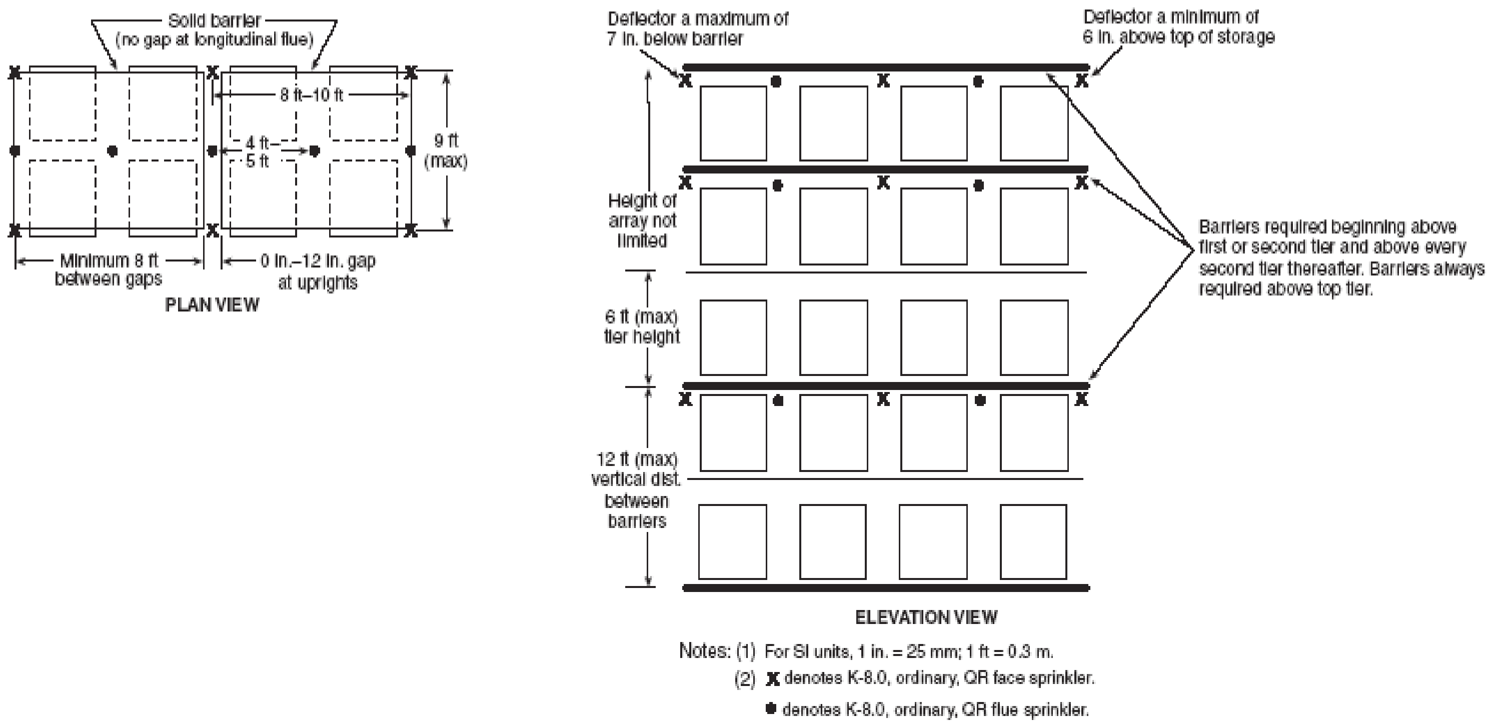


FIGURE 16.6.3.1(b) Double-Row Rack Sprinkler Layout for Design Scheme "C."

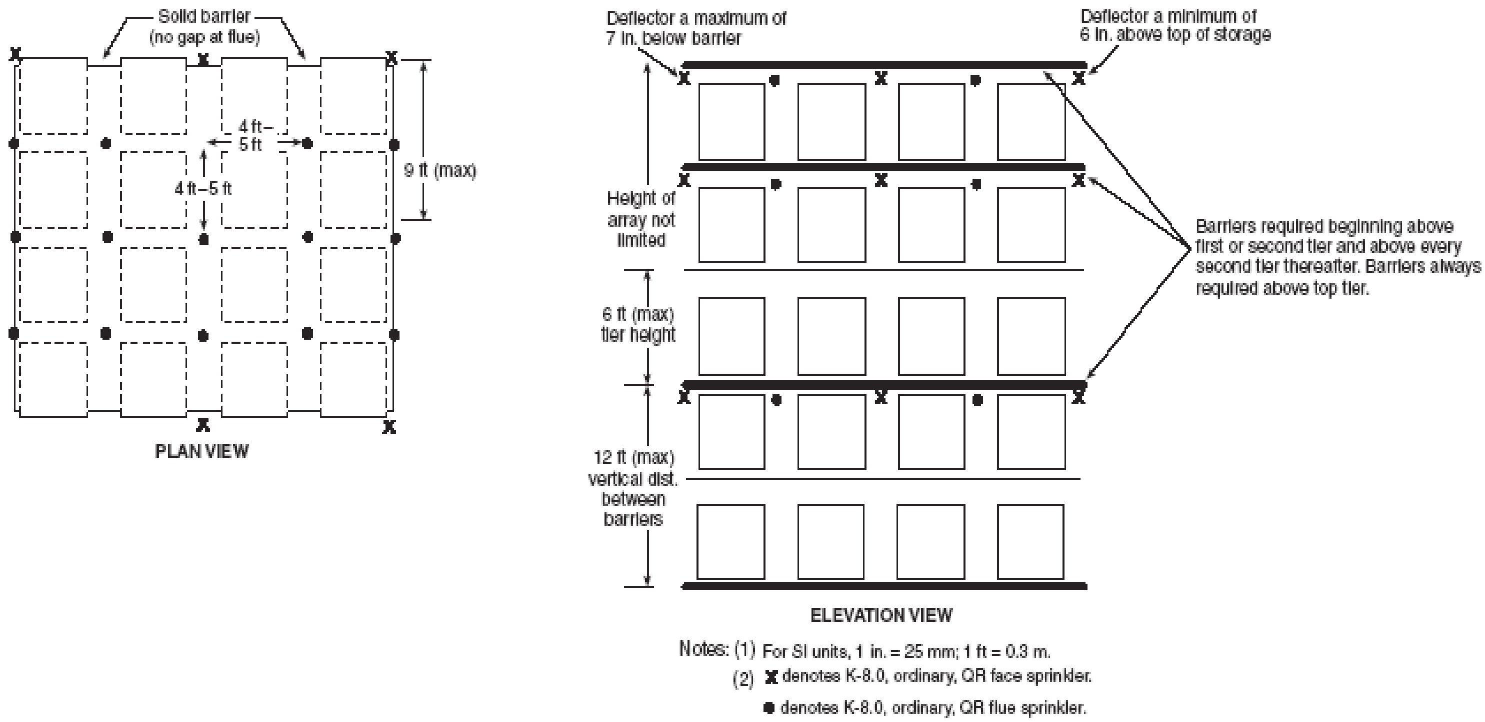


FIGURE 16.6.3.1(c) Multiple-Row Rack Sprinkler Layout for Design Scheme "C."

16.6.3.2 Vertical baffles shall not be installed between in-rack sprinklers.

16.6.3.3 In-rack sprinklers shall meet the following requirements:

(1) In-rack sprinklers shall be nominal K=8.0, ordinary temperature–rated, quick-response sprinklers.

(2) In-rack sprinklers shall be installed below each barrier level.

(3) In-rack sprinklers shall provide a minimum end operating pressure (gauge pressure) of 14 psi (97 kPa) out of the hydraulically most remote six sprinklers (three on two lines), if one barrier level is provided, or the hydraulically most remote eight sprinklers (four on two lines), if two or more barrier levels are provided.

16.6.3.4 If there are adjacent bays of in-rack arrays that are not dedicated to storage of liquids, the barrier and in-rack sprinkler protection shall be extended at least 8 ft (2.4 m) beyond the area devoted to liquid storage.

16.6.3.5 Ceiling sprinkler demand shall not be included in the hydraulic calculations for in-rack sprinklers.

16.6.3.6 Water demand at point of supply shall be calculated separately for in-rack and ceiling sprinklers and shall be based on the greater demand.

16.6.3.7 Ceiling sprinklers shall meet the following requirements:

(1) Ceiling sprinkler protection shall be designed to protect the surrounding occupancy.

(2) Any sprinkler type shall be acceptable.

(3) If standard spray sprinklers are used, they shall be capable of providing not less than 0.20 gpm/ft^2 over 3000 ft^2 (8 mm/min over 270 m^2).

(4) If the liquid storage does not extend to the full height of the rack, protection for commodities stored above the top horizontal barrier shall meet the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems*, for the commodities stored, based on the full height of the rack.

16.6.3.8 A 500 gpm (1900 L/min) hose stream allowance shall be provided.

16.6.4 In-Rack Sprinkler Layouts for Table 16.5.2.8. Where indicated in Table 16.5.2.8, in-rack sprinklers shall be installed in accordance with Figure 16.6.4(a), Figure 16.6.4(b), Figure 16.6.4(c), Figure 16.6.4(d), or Figure 16.6.4(e), whichever is applicable.

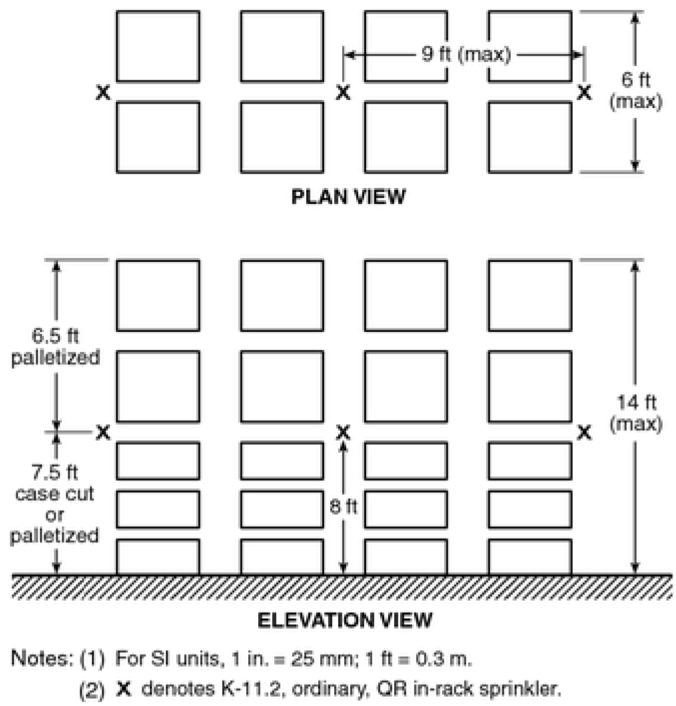
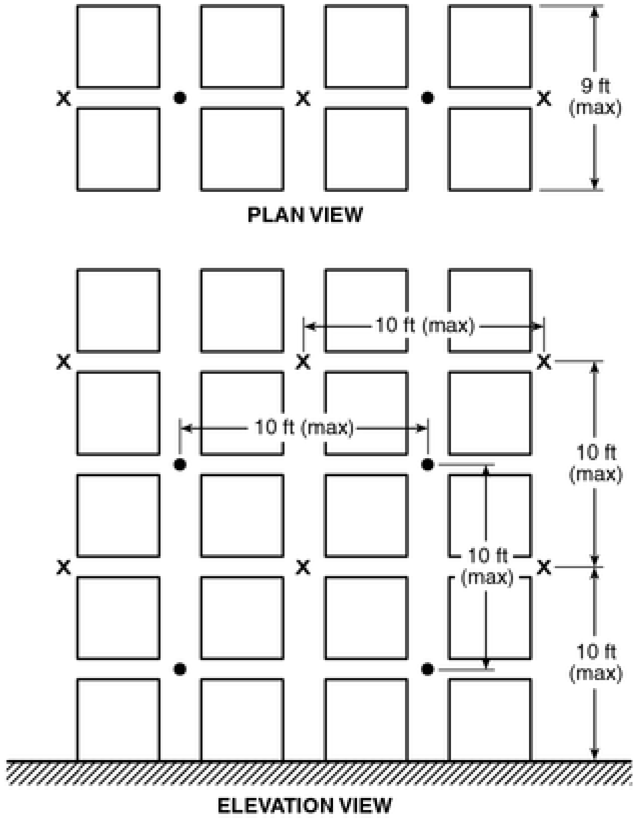
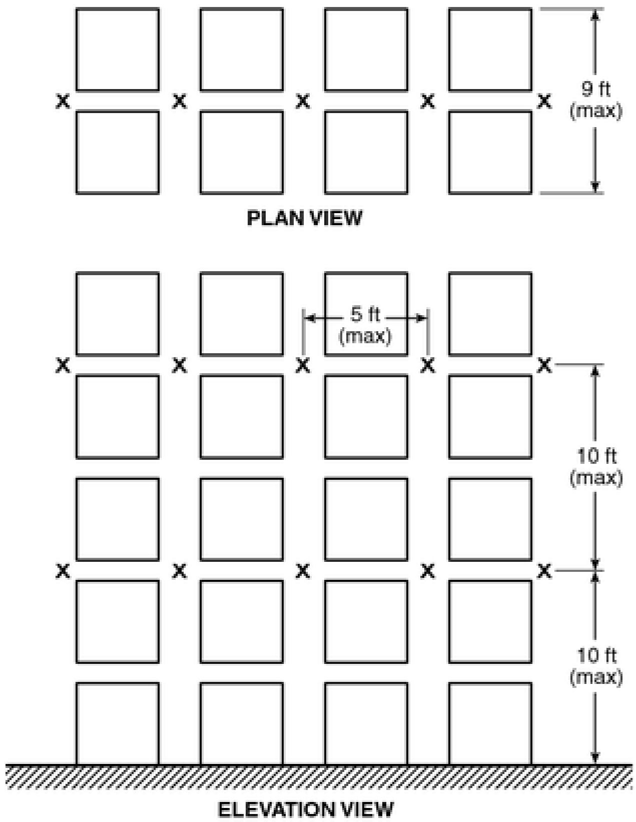


FIGURE 16.6.4(a) Double-Row Rack Sprinkler Layout G.



Notes: (1) For SI units, 1 in. = 25 mm; 1 ft = 0.3 m.
(2) ● and **X** denote K-8.0, QR in-rack sprinklers.

FIGURE 16.6.4(b) Double-Row Rack Sprinkler Layout I — Option #1.



Notes: (1) For SI units, 1 in. = 25 mm; 1 ft = 0.3 m.
(2) X denotes K-8.0, QR in-rack sprinkler.

FIGURE 16.6.4(c) Double-Row Rack Sprinkler Layout I — Option #2.

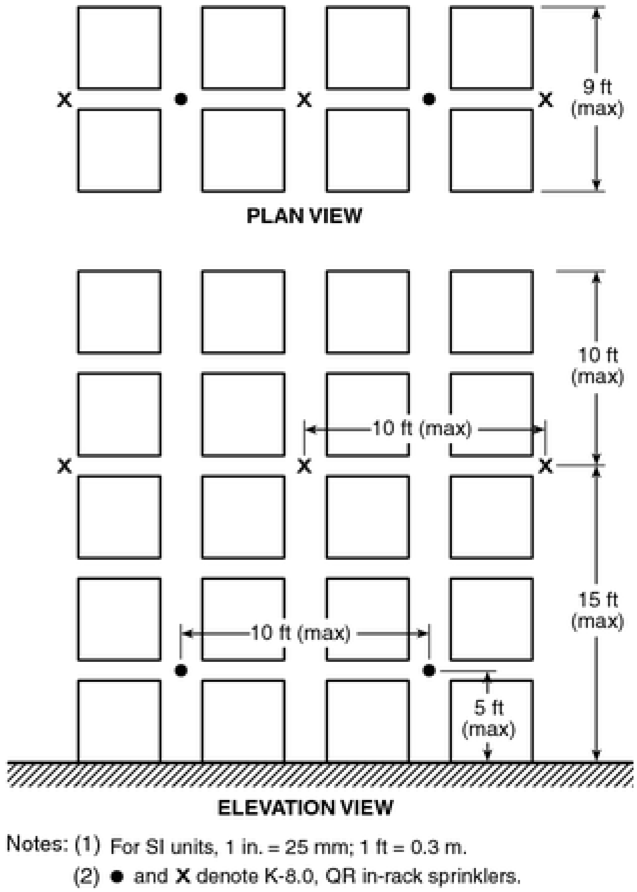


FIGURE 16.6.4(d) Double-Row Rack Sprinkler Layout H — Option #1.

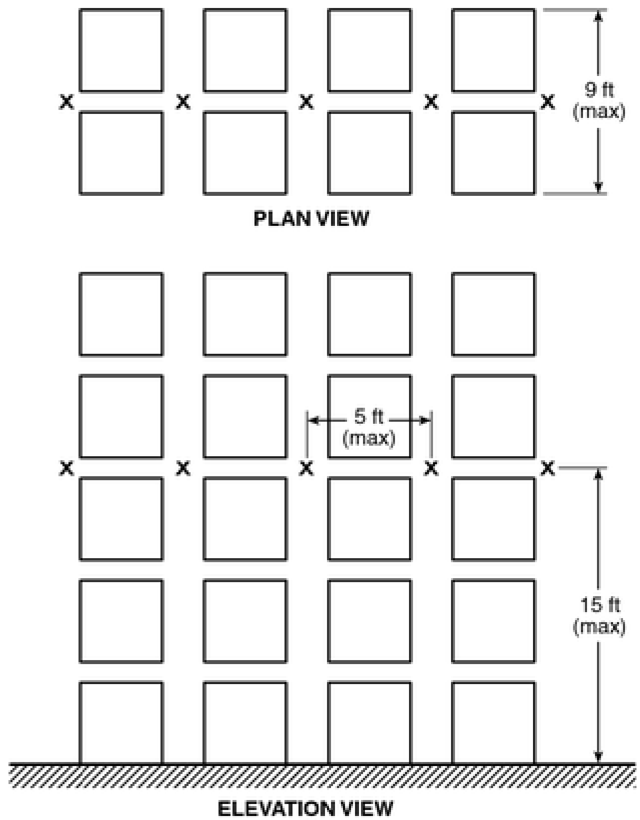


FIGURE 16.6.4(e) Double-Row Rack Sprinkler Layout H — Option #2.

16.7 Water Supply.

Water supplies for automatic sprinklers, other water-based protection systems, hose streams, and hydrants shall be capable of supplying the anticipated water flow demand for a minimum of 2 hours.

16.8 Containment, Drainage, and Spill Control.

16.8.1 Containment or containment and drainage shall be provided in accordance with Figure 16.8.1, when protection systems are installed in accordance with the provisions of this chapter.

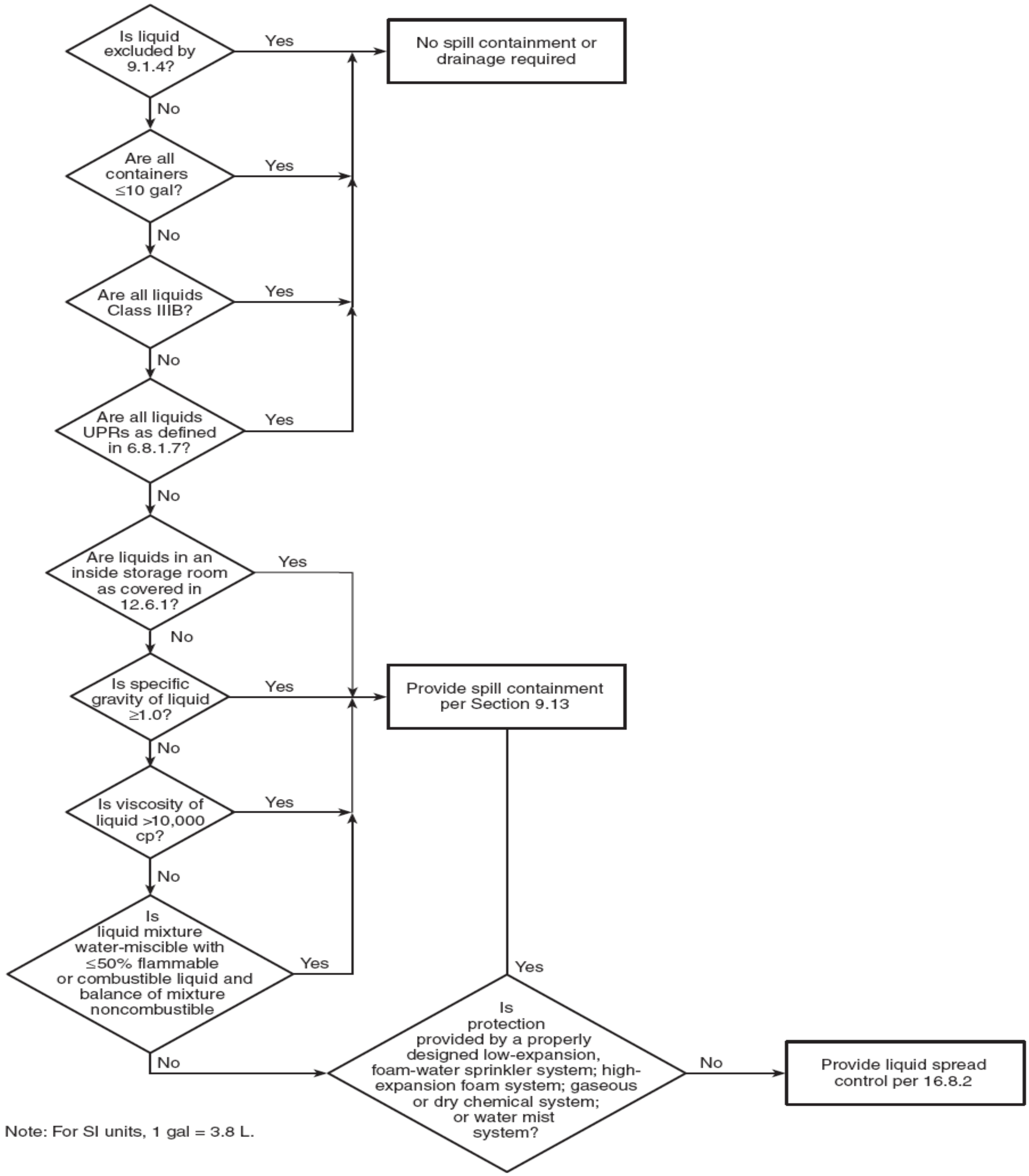

Is liquid excluded by 9.1.4?
Yes
No spill containment or drainage required
No
Are all containers ≤10 gal?
Yes
No
Are all liquids Class IIIB?
Yes
No
Are all liquids UPRs as defined in 6.8.1.7?
Yes
No
Are liquids in an inside storage room as covered in 12.6.1?
Yes
No
Is specific gravity of liquid ≥1.0?
Yes
Provide spill containment per Section 9.13
No
Is viscosity of liquid >10,000 cp?
Yes
No
Is liquid mixture water-miscible with ≤50% flammable or combustible liquid and balance of mixture noncombustible
Yes
No
Yes
Is protection provided by a properly designed low-expansion, foam-water sprinkler system; high-expansion foam system; gaseous or dry chemical system; or water mist system?
No
Provide liquid spread control per 16.8.2
Note: For SI units, 1 gal = 3.8 L.

FIGURE 16.8.1 Spill Containment and Liquid Spread Control for Protected Storage.

16.8.2* Where control of the spread of liquid is required, means to limit the spread of liquid to an area not greater than the design discharge area of the ceiling sprinkler system shall be provided.

16.9 Other Automatic Fire Protection Systems.

Alternate fire protection systems, such as automatic water spray systems, automatic water mist systems, high-expansion foam systems, dry chemical extinguishing systems, alternate sprinkler system configurations, or combinations of systems shall be permitted if approved by the authority having jurisdiction. Such alternate systems shall be designed and installed in accordance with the appropriate NFPA standard and with manufacturer's recommendations for the system(s) selected.

Chapter 17 Processing Facilities

17.1 Scope.

17.1.1* This chapter shall apply where the processing of liquids is the principal activity, except as covered elsewhere in this code or in other NFPA standards. *(See 1.5.3.)*

17.1.2 Provisions of this chapter shall not prohibit the use of movable tanks for the dispensing of flammable or combustible liquids into fuel tanks of motorized equipment outside on premises not accessible to the public, where such use has the approval of the authority having jurisdiction.

17.2 Definitions Specific to Chapter 17. (Reserved)

17.3 General Requirements.

17.3.1 Liquid processing operations shall be located and operated so that they do not constitute a significant fire or explosion hazard to life, to property of others, or to important buildings or facilities within the same plant.

17.3.2 Specific requirements shall depend on the inherent risk in the operations themselves, including the liquids being processed, operating temperatures and pressures, and the capability to control any liquid or vapor releases or fire incidents that could occur.

17.3.3 The interrelationship of the many factors involved shall be based on good engineering and management practices to establish suitable physical and operating requirements.

17.3.4 Process facilities shall comply with the applicable requirements for specific operations set forth in Chapters 18, 19, 28, or 29.

17.3.5 Process facilities shall comply with the applicable requirements for procedures and practices for fire prevention, fire protection, and fire control set forth in Chapter 6.

17.4 Location of Process Vessels and Equipment.

17.4.1 Liquid-processing vessels and equipment shall be located in accordance with the requirements of this section.

17.4.2 Processing vessels and buildings containing such processing vessels shall be located so that a fire involving the vessels does not constitute an exposure hazard to other occupancies.

17.4.3 The minimum distance of a processing vessel to a property line that is or can be built upon, including the opposite side of a public way; to the nearest side of a public way; or to the nearest important building on the same property shall be one of the following:

(1) In accordance with Table 17.4.3

(2) Determined by an engineering evaluation of the process, followed by application of sound fire protection and process engineering principles

Table 17.4.3 Location of Process Vessels with Respect to Property Lines, Public Ways, and the Nearest Important Building on the Same Property — Protection for Exposures Is Provided

	Minimum Distance (ft)							
	From Property Line that Is or Can Be Built upon, Including Opposite Side of Public Way				From Nearest Side of Any Public Way or from Nearest Important Building on Same Property that Is Not an Integral Part of the Process			
	Stable Liquid Emergency Relief*		Unstable Liquid Emergency Relief*		Stable Liquid Emergency Relief		Unstable Liquid Emergency Relief*	
Vessel Maximum Operating Liquid Capacity (gal)	Not Over 2.5 psi	Over 2.5 psi	Not Over 2.5 psi	Over 2.5 psi	Not Over 2.5 psi	Over 2.5 psi	Not Over 2.5 psi	Over 2.5 psi
275 or less	5	10	15	20	5	10	15	20
276 to 750	10	15	25	40	5	10	15	20
751 to 12,000	15	25	40	60	5	10	15	20
12,001 to 30,000	20	30	50	80	5	10	15	20
30,001 to 50,000	30	45	75	120	10	15	25	40
50,001 to 100,000	50	75	125	200	15	25	40	60
Over 100,000	80	120	200	300	25	40	65	100

For SI units, 1 gal = 3.8 L; 1 ft = 0.3 m; 1 psi = a gauge pressure of 6.9 kPa.
Note: Double all of above distances where protection for exposures is not provided.
*Gauge pressure.

17.4.4 Where process vessels are located in a building and the exterior wall facing the exposure (line of adjoining property that is or can be built upon or nearest important building on the same property) is greater than 25 ft (7.6 m) from the exposure and is a blank wall having a fire resistance rating of not less than 2 hours, any greater distances required by Table 17.4.3 shall be permitted to be waived. If the exterior wall is a blank wall having a fire resistance rating of not less than 4 hours, all distances required by Table 17.4.3 shall be permitted to be waived.

17.4.5 All the distances given in Table 17.4.3 shall be doubled where protection for exposures is not provided.

17.4.6* Liquid-processing equipment, such as pumps, heaters, filters, and exchangers, shall not be located closer than 25 ft (7.6 m) to property lines where the adjoining property is or can be built upon or to the nearest important building on the same property that is not an integral part of the process. This spacing requirement shall be permitted to be waived where exposures are protected in accordance with 17.4.3.

17.4.7 Processing equipment in which unstable liquids are handled shall be separated from unrelated plant facilities by either of the following:

(1) 25 ft (7.6 m) clear spacing

(2) A wall having a fire resistance rating of not less than 2 hours and explosion resistance consistent with the expected hazard

17.5 Accessibility.

Each process unit or building containing liquid-processing equipment shall be accessible from at least one side for fire fighting and fire control.

17.6 Construction Requirements.

17.6.1 Process buildings or structures used for liquid operations shall be constructed consistent with the operations being conducted and with the classes of liquids handled. They shall be constructed to minimum Type II (000) construction, as defined in *NFPA 5000, Building Construction and Safety Code*, and shall be constructed in accordance with Table 17.6.1.

Table 17.6.1 Minimum Separation Distances for Buildings or Structures Used for Liquid Handling and Operations

		Minimum Separation Distance (ft)	
Liquid Class	Minimum Type of Construction*	To Street, Alley, or Public Way	To Adjacent Property Line that Is or Can Be Built Upon
Class I liquids; unstable liquids of any class; liquids of any class heated above their flash points	II (222)	5	10
	II (111)	5	25
	II (000)	10	50
Class II	II (111)	5	10
	II (000)	5	25
Class III	II (000)	5	10

For SI units, 1 ft = 0.3 m.
Note: Distances apply to properties that have protection for exposures, as defined in this code. If there are exposures for which protection does not exist, the distances should be doubled, in accordance with 17.6.3.
*Construction types are defined in NFPA 220, *Standard on Types of Building Construction*.

17.6.2 Construction types shall be as defined in *NFPA 5000, Building Construction and Safety Code*.

17.6.3 Where protection for exposures is not provided, the applicable distances given in Table 17.6.1 shall be doubled.

17.6.4 For buildings or structures that are not provided with approved automatic sprinkler protection, the separation distances otherwise required by Table 17.6.1 shall be determined by an engineering evaluation of the process, but shall not be less than the separation distances required by Table 17.4.3.

17.6.5 Buildings or structures used solely for blending, mixing, or dispensing of Class IIIB liquids at temperatures below their flash points shall be permitted to be constructed of combustible construction, subject to the approval of the authority having jurisdiction.

17.6.6 Buildings or structures used for processing or handling of liquids where the quantities of liquids do not exceed 360 gal (1360 L) of Class I and Class II liquids and 720 gal (2725 L) of Class III liquids shall be permitted to be constructed of combustible construction, subject to the approval of the authority having jurisdiction.

17.6.7 Buildings or structures used for processing or handling of liquids protected with automatic sprinklers or equivalent fire protection systems shall be permitted to be constructed of combustible construction, subject to the approval of the authority having jurisdiction.

17.6.8* Load-bearing building supports and load-bearing supports of vessels and equipment capable of releasing quantities of liquids that could result in a fire capable of causing substantial property damage shall be protected by one or more of the following:

(1) Drainage to a safe location to prevent liquids from accumulating under vessels or equipment

(2) Fire-resistive construction

(3) Fire-resistant protective coatings or systems

(4) Water spray systems designed and installed in accordance with NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*

(5) Other alternate means acceptable to the authority having jurisdiction

17.6.9 Class I liquids shall not be handled or used in basements.

17.6.9.1 Where Class I liquids are handled or used above grade within buildings with basements or closed pits into which flammable vapors can travel, such belowgrade areas shall be provided with mechanical ventilation designed to prevent the accumulation of flammable vapors.

17.6.9.2 Means shall be provided to prevent liquid spills from running into basements.

17.6.10* Smoke and heat venting shall be permitted to be used where it assists access for fire fighting.

17.6.11* Areas shall have exit facilities arranged to prevent occupants from being trapped in the event of fire.

17.6.11.1 Exits shall not be exposed by the drainage facilities described in Section 17.10.

17.6.12 Aisles shall be maintained for unobstructed movement of personnel and fire protection equipment.

17.6.13 Indoor areas where Class IA or unstable liquids are in use shall be designed to direct flame, combustion gases, and pressures resulting from a deflagration away from important buildings or occupied areas through the use of damage-limiting construction in accordance with NFPA 68, *Standard on Explosion Protection by Deflagration*

Venting.

17.6.13.1 The damage-limiting construction design shall be in accordance with recognized standards and shall be acceptable to the authority having jurisdiction. *(See A.9.16.1.)*

17.6.13.2 Where unstable liquids are in use, an approved engineered construction method that is designed to limit damage from an explosion (deflagration or detonation, depending on the characteristics of the liquid) shall be used.

17.7 Fire Protection. (Reserved)

17.8 Emergency Control Systems. (Reserved)

17.9 Electrical Systems.

Electrical wiring and electrical utilization equipment shall comply with Chapter 7.

17.10 Containment, Drainage, and Spill Control.

17.10.1* Emergency drainage systems shall be provided to direct liquid leakage and fire protection water to a safe location.

17.10.2 Emergency drainage systems, if connected to public sewers or discharged into public waterways, shall be equipped with traps or separators.

17.10.3 A facility shall be designed and operated to prevent the discharge of liquids to public waterways, public sewers, or adjoining property.

17.11 Ventilation.

17.11.1 Enclosed processing areas handling or using Class I liquids, or Class II or Class III liquids heated to temperatures at or above their flash points, shall be ventilated at a rate sufficient to maintain the concentration of vapors within the area at or below 25 percent of the LFL. Compliance with 17.11.2 through 17.11.10 shall be deemed as meeting the requirements of this section.

17.11.2* Ventilation requirements shall be confirmed by one of the following:

(1) Calculations based on the anticipated fugitive emissions *(see Annex F for calculation method)*.

(2) Sampling of the actual vapor concentration under normal operating conditions. Sampling shall be conducted at a 5 ft (1.5 m) radius from each potential vapor source extending to or toward the bottom and the top of the enclosed processing area. The vapor concentration used to determine the required ventilation rate shall be the highest measured concentration during the sampling procedure.

17.11.3 A ventilation rate of not less than 1 $ft^3/min/ft^2$ (0.3 $m^3/min/m^2$) of solid floor area shall be considered as meeting the requirements of 17.11.1.

17.11.4 Ventilation shall be accomplished by mechanical or natural means.

17.11.5 Exhaust ventilation discharge shall be to a safe location outside the building.

17.11.6 Recirculation of the exhaust air shall be permitted only when it is monitored continuously using a fail-safe system that is designed to automatically sound an alarm, stop recirculation, and provide full exhaust to the outside in the event that vapor–air mixtures in concentrations over one-fourth of the lower flammable limit are detected.

17.11.7* Provision shall be made for introduction of make-up air in such a manner as to avoid short-circuiting the ventilation.

17.11.8 Ventilation shall be arranged to include all floor areas or pits where flammable vapors can collect.

17.11.9 Local or spot ventilation to control special fire or health hazards, if provided, shall be permitted to be utilized for up to 75 percent of the required ventilation.

17.11.10 Where equipment such as dispensing stations, open centrifuges, plate and frame filters, and open vacuum filters is used in a building, the equipment and ventilation of the building shall be designed to limit flammable vapor–air mixtures under normal operating conditions to the interior of equipment and to not more than 5 ft (1.5 m) from equipment that exposes Class I liquids to the air.

17.12 Explosion Control. (Reserved)

17.13 Process Structures. (Reserved)

17.14* Process Equipment and Vessels.

Equipment shall be designed and arranged to prevent the unintentional escape of liquids and vapors and to minimize the quantity escaping in the event of accidental release.

17.15 Management of Operations Hazards.

17.15.1 This section shall apply to the management methodology used to identify, evaluate, and control the hazards involved in processing and handling of flammable and combustible liquids. These hazards include, but are not limited to, preparation; separation; purification; and change of state, energy content, or composition.

17.15.2 Operations involving flammable and combustible liquids shall be reviewed to ensure that fire and explosion hazards resulting from loss of containment of liquids are provided with corresponding fire prevention and emergency action plans.

Exception No. 1: Operations where liquids are used solely for on-site consumption as fuels.

Exception No. 2: Operations where Class II or Class III liquids are stored in atmospheric tanks or transferred at temperatures below their flash points.

Exception No. 3: Mercantile occupancies, crude petroleum exploration, drillings, and well servicing operations, and normally unoccupied facilities in remote locations.

17.15.3 The extent of fire prevention and control that is provided shall be determined by means of an engineering evaluation of the operation and application of sound fire protection and process engineering principles. This evaluation shall include, but not be limited to, the following:

(1) Analysis of the fire and explosion hazards of the operation

(2) Analysis of emergency relief from process vessels, taking into consideration the properties of the materials used and the fire-protection and control measures taken

(3) Analysis of applicable facility design requirements in Section 17.3 through Section 17.4

(4) Analysis of applicable requirements in Chapters 18, 19, 28, and 29 for liquid handling, transfer, and use

(5) Analysis of local conditions, such as exposure to and from adjacent properties and exposure to floods, earthquakes, and windstorms

(6) Analysis of the emergency response capabilities of the local emergency services

17.15.4 A written emergency action plan that is consistent with available equipment and personnel shall be established to respond to fires and related emergencies. This plan shall include the following:

(1) Procedures to be followed in case of fire, such as sounding the alarm, notifying the fire department, evacuating personnel, and controlling and extinguishing the fire

(2) Procedures and schedules for conducting drills of these procedures

(3) Appointment and training of personnel to carry out assigned duties, which shall be reviewed at the time of initial assignment, as responsibilities or response actions change, and whenever anticipated duties change

(4) Maintenance of fire protection equipment

(5) Procedures for shutting down or isolating equipment to reduce the release of liquid, which shall include assigning personnel responsible for maintaining critical plant functions or shutdown of plant processes

(6) Alternate measures for the safety of occupants

17.15.5 The fire hazards management review conducted in accordance with 17.15.2 shall be repeated whenever the hazards leading to a fire or explosion change significantly. Conditions that might require repeating a review shall include, but are not limited to, the following:

(1) When changes occur in the materials in process

(2) When changes occur in process equipment

(3) When changes occur in process control

(4) When changes occur in operating procedures or assignments

Chapter 18 Dispensing, Handling, Transfer, and Use of Liquids

18.1 Scope.

This chapter applies where liquids are handled, dispensed, transferred, or used. This chapter also applies to the processing of liquids.

18.2 Definitions Specific to Chapter 18. (Reserved)

18.3 Dispensing, Handling, Transfer, and Use.

18.3.1 Class I liquids shall be kept in closed tanks or containers when not actually in use. Class II and Class III liquids shall be kept in closed tanks or containers when ambient or process temperature is at or above their flash point.

18.3.2 Where liquids are used or handled, provisions shall be made to promptly and safely dispose of leakage or spills.

18.3.3 Class I liquids shall not be used outside closed systems where there are open flames or other ignition sources within the classified areas set forth in Chapter 7.

18.3.4 Transfer of liquids among vessels, containers, tanks, and piping systems by means of air or inert gas pressure shall be permitted only under all of the following conditions:

(1) The vessels, containers, tanks, and piping systems shall be designed for such pressurized transfer and shall be capable of withstanding the anticipated operating pressure.

(2) Safety and operating controls, including pressure-relief devices, shall be provided to prevent overpressure of any part of the system.

(3) Only inert gas shall be used to transfer Class I liquids. Only inert gas shall be used to transfer Class II and Class III liquids that are heated above their flash points.

18.3.5 Positive displacement pumps shall be provided with pressure relief that discharges back to the tank, pump suction, or other suitable location or shall be provided with interlocks to prevent overpressure.

18.3.6 Piping, valves, and fittings shall meet the requirements of Chapter 27.

18.3.7 Listed flexible connectors shall be permitted to be used where vibration exists. Approved hose shall be permitted to be used at transfer stations.

18.3.8* The staging of liquids in containers, intermediate bulk containers, and portable tanks shall be limited to the following:

(1) Containers, intermediate bulk containers, and portable tanks that are in use

(2) Containers, intermediate bulk containers, and portable tanks that were filled during a single shift

(3) Containers, intermediate bulk containers, and portable tanks needed to supply the process for one continuous 24-hour period

(4) Containers, intermediate bulk containers, and portable tanks that are stored in accordance with Chapter 9

18.3.9 Class I, Class II, or Class IIIA liquids used in a process and staged in the process area shall not be filled in the process area.

Exception No. 1: Intermediate bulk containers and portable tanks that meet the requirements of Chapter 9.

Exception No. 2: Intermediate products that are manufactured in the process area.

18.4 Incidental Operations.

18.4.1* This section shall apply to areas where the use, handling, and storage of liquids is only a limited activity to the established occupancy classification.

18.4.2 Class I liquids or Class II and Class III liquids that are heated up to or above their flash points shall be drawn from or transferred into vessels, containers, or portable tanks as follows:

(1) From original shipping containers with a capacity of 5.3 gal (20 L) or less

(2) From safety cans

(3) Through a closed piping system

(4) From portable tanks or containers by means of a device that has antisiphoning protection and that draws through an opening in the top of the tank or container

(5) By gravity through a listed self-closing valve or self-closing faucet

18.4.2.1 If hose is used in the transfer operation, it shall be equipped with a self-closing valve without a hold-open latch in addition to the outlet valve. Only listed or approved hose shall be used.

18.4.2.2 Means shall be provided to minimize generation of static electricity. Such means shall meet the requirements of 6.5.4.

18.4.2.3 Where pumps are used for liquid transfer, means shall be provided to deactivate liquid transfer in the event of a liquid spill or fire.

18.4.3 Storage of liquids other than those governed by 18.4.4 and 18.4.5 shall comply with Chapter 9.

18.4.4 The quantity of liquid located outside of identified storage areas, such as storage cabinets, other inside liquid storage areas, general-purpose warehouses, or other specific processing areas that are cut off from the general plant area by at least a 2-hour fire separation, shall meet the requirements of 18.4.4.1.

18.4.4.1 The maximum quantity of liquids permitted for incidental operations in a single fire area shall not exceed the greater of the following:

(1)* The amount required to supply incidental operations for one continuous 24-hour period; or

(2) The aggregate sum of the following:

   (a) 25 gal (95 L) of Class IA liquids in containers

   (b) 120 gal (454 L) of Class IB, Class IC, Class II, or Class III liquids in containers

   (c) 1585 gal (6000 L) of any combination of the following:

      i. Class IB, IC, II, or IIIA liquids in metal portable tanks or metal intermediate bulk containers, each not exceeding 793 gal (3000 L)

      ii. Class II or Class IIIA liquids in nonmetallic intermediate bulk containers, each not exceeding 793 gal (3000 L)

(d) 20 portable tanks or intermediate bulk containers each not exceeding 793 gal (3000 L) of Class IIIB liquids

18.4.5 Where quantities of liquids in excess of the limits in 18.4.4.1 are necessary, storage shall be in tanks that meet all applicable requirements of Chapter 17, Chapters 21 through 25, and Chapter 27.

18.4.6 Areas in which liquids are transferred from one tank or container to another container shall be provided with the following:

(1) Separation from other operations where potential ignition sources are present by distance or by fire-resistant construction

(2) Drainage or other means to control spills

(3) * Natural or mechanical ventilation that meets the requirements of Section 17.11

18.5 Ventilation for Dispensing Areas.

Liquid storage areas where dispensing is conducted shall be provided with either a gravity system or a continuous mechanical exhaust ventilation system. Mechanical ventilation shall be used if Class I liquids are dispensed within the room.

18.5.1 Exhaust air shall be taken from a point near a wall on one side of the room and within 12 in. (300 mm) of the floor, with one or more make-up inlets located on the opposite side of the room within 12 in. (300 mm) of the floor.

18.5.2 The location of both the exhaust and inlet air openings shall be arranged to provide air movement across all portions of the floor to prevent accumulation of flammable vapors.

18.5.3 Exhaust from the room shall be conducted directly to the exterior of the building and shall not be recirculated.

18.5.3.1 Recirculation of the exhaust air shall be permitted only when it is monitored continuously using a fail-safe system that is designed to automatically sound an alarm, stop recirculation, and provide full exhaust to the outside in the event that vapor-air mixtures in concentrations over one-fourth of the lower flammable limit are detected.

18.5.4 If ducts are used, they shall not be used for any other purpose and shall comply with NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*.

18.5.4.1 If make-up air to a mechanical system is taken from within the building, the opening shall be equipped with a fire door or damper, as required in NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*.

18.5.4.2 For gravity systems, the make-up air shall be supplied from outside the building.

18.5.5 Mechanical ventilation systems shall provide at least 1 cfm of exhaust air for each square foot of floor area (0.3 $m^3/min/m^2$), but not less than 150 cfm (4 m^3/min).

18.5.5.1 The mechanical ventilation system for dispensing areas shall be equipped with an airflow switch or other equally reliable method that is interlocked to sound an audible alarm upon failure of the ventilation system.

Chapter 19 Specific Operations

19.1 Scope.

This chapter shall apply to the handling and use of flammable and combustible liquids in specific operations as herein described.

19.2 Definitions Specific to Chapter 19. (Reserved)

19.3 General Requirements. (Reserved)

19.4 Recirculating Heat Transfer Systems.

19.4.1 Scope.

19.4.1.1 This section shall apply only to recirculating heat transfer systems that use a heat transfer fluid that is heated up to or above its flash point under normal operation.

19.4.1.2 This section shall not apply to process streams used as a means of heat transfer or to any heat transfer system of 60 gal (230 L) capacity or less.

19.4.2* General Requirements. A heater or vaporizer for heat transfer fluid that is located inside a building shall meet all applicable requirements of Chapter 17.

19.4.3* System Design.

19.4.3.1* Drainage shall be provided at strategic low points in the heat transfer system. Drains shall be piped to a safe location that is capable of accommodating the total capacity of the system or the capacity of that part of the system that is isolated.

19.4.3.2* Where the heat transfer system expansion tank is located above floor level and has a capacity of more than 250 gal (950 L), it shall be provided with a low-point drain line that can allow the expansion tank to drain to a drain tank on a lower level. The drain line valve shall be operable from a safe location.

19.4.3.3 A heat transfer fluid system shall not be used to provide direct building heat.

19.4.3.4 All pressure-relief device outlets shall be piped to a safe location.

19.4.4* Fuel Burner Controls and Interlocks. Oil- or gas-fired heaters or vaporizers shall be designed and installed in accordance with the applicable requirements of NFPA 31, *Standard for the Installation of Oil-Burning Equipment*, or NFPA 85, *Boiler and Combustion Systems Hazards Code*, whichever is applicable. Wood dust suspension-fired heaters or vaporizers shall be designed and installed in accordance with the applicable requirements of NFPA 85.

19.4.5 Piping.

19.4.5.1* Piping shall meet all applicable requirements of Chapter 27.

19.4.5.2 All pipe connections shall be welded.

19.4.5.2.1 Welded, threaded connections shall be permitted to be used for piping 2 in. (50 mm) and smaller.

19.4.5.2.2 Mechanical joints shall be permitted to be used at pump, valve, and equipment connections.

19.4.5.3 New piping that is to be insulated with permanent insulation and existing piping that has been disturbed and is to be reinsulated with permanent insulation shall be covered with a closed-cell, nonabsorbent insulation material.

19.4.5.3.1 Where all pipe joints are welded and where there are no other points in the system subject to leakage, such as at valves or pumps, other types of insulation shall be permitted.

19.4.5.3.2 Where dams are formed around possible leak-producing areas, using metal "donut" flanges that are welded to the pipe or using a "donut" segment of nonabsorbent insulation sealed to the pipe to prevent migration of leakage into adjacent insulation, the piping from dam to dam shall be considered to be a closed system and other types of insulation shall be permitted. The area subject to leakage where the dam has been constructed shall be insulated with nonabsorbent insulation or a nonabsorbent insulation system.

19.4.5.3.3 Where removable, reusable insulated covers are required for access, the covers shall be fabricated of flexible or rigid insulation that is encapsulated in a manner to provide a nonabsorbent insulation system to prevent absorption of leakage into the insulation.

19.4.6 Fire Protection.

19.4.6.1* Automatic sprinkler protection meeting the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems*, for Extra Hazard (Group I) Occupancies shall be provided for building areas containing a heat transfer system heater or vaporizer.

19.4.6.2 An alternate fire protection system shall be permitted to be used, if approved by the authority having jurisdiction. Such alternate system shall be designed and installed in accordance with the appropriate NFPA standard and with manufacturer's recommendations for the system selected.

19.4.7 Operation.

19.4.7.1* Operations involving heat transfer fluid systems and equipment shall be reviewed to ensure that the fire and explosion hazards resulting from loss of containment of the fluid or failure of the system are provided with corresponding fire prevention and emergency action plans.

19.4.7.2 Operators of heat transfer systems shall be trained in the hazards of improper operation of the system and leakage and shall be trained to recognize upset conditions that can lead to dangerous situations.

19.4.7.3 Safety interlocks shall be inspected, calibrated, and tested annually or at other intervals established in accordance with other applicable standards to determine that they are in proper operating condition.

19.5 Vapor Recovery and Vapor Processing Systems.

19.5.1 Scope.

19.5.1.1 This section shall apply to vapor recovery and vapor processing systems where the vapor source operates at pressures from vacuum up to and including a gauge pressure of 1.0 psi (6.9 kPa), or where there is a potential for vapor mixtures in the flammable range.

19.5.1.2 This section shall not apply to the following:

(1) Marine systems that comply with U.S. Department of Transportation Regulations in Title 33, Code of Federal

Regulations, Parts 154, 155, and 156, and U.S. Coast Guard Regulations in Title 46, Code of Federal Regulations, Parts 30, 32, 35, and 39

(2) Marine and automotive service station systems that comply with NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*

19.5.2 Overpressure Protection and Vacuum Protection. Tanks and equipment shall have independent venting for overpressure or vacuum conditions that could occur from malfunction of the vapor recovery or vapor processing system.

Exception: For tanks, venting shall comply with 21.4.3.

19.5.3 Vent Location.

19.5.3.1 Vents on vapor processing systems shall be not less than 12 ft (3.7 m) from adjacent ground level, with outlets located and directed so that ignitible vapors will disperse to a concentration below the lower flammable limit before reaching any location that contains an ignition source.

19.5.3.2 Vapor processing equipment and their vents shall be located in accordance with Section 17.3.

19.5.4 Vapor Collection Systems.

19.5.4.1 Vapor collection piping shall be designed to prevent trapping liquid.

19.5.4.2 Vapor recovery and vapor processing systems that are not designed to handle liquid shall be provided with a means to eliminate any liquid that carries over to or condenses in the vapor collection system.

19.5.5 Liquid Level Monitoring.

19.5.5.1* A liquid knock-out vessel used in the vapor collection system shall have means to verify the liquid level and a high liquid level sensor that activates an alarm.

19.5.5.2 For unattended facilities, the high liquid level sensor shall initiate shutdown of liquid transfer into the vessel and shutdown of vapor recovery or vapor processing systems.

19.5.6 Overfill Protection.

19.5.6.1 Storage tanks served by vapor processing or vapor recovery systems shall be equipped with overfill protection in accordance with 21.7.1.

19.5.6.2 Overfill protection of tank vehicles shall be in accordance with applicable provisions of 28.11.1.

19.5.7 Sources of Ignition.

19.5.7.1 Vapor Release. Tank or equipment openings provided for purposes of vapor recovery shall be protected against possible vapor release in accordance with 23.13.7 and 28.11.1.8.1.

19.5.7.2* Electrical Area Classification. Electrical area classification shall be in accordance with Chapter 7.

19.5.7.3* Static Electricity. Vapor collection and vapor processing equipment shall be protected against static electricity in accordance with 6.5.4.

19.5.7.4* Spontaneous Ignition. Equipment shall be designed or written procedures established to prevent ignition where the potential exists for spontaneous ignition.

19.5.7.5* Friction Heat or Sparks from Mechanical Equipment. Mechanical equipment used to move vapors that are in the flammable range shall be designed to prevent sparks or other ignition sources under both normal and equipment malfunction conditions.

19.5.7.6* Flame Propagation. Where there is reasonable potential for ignition of a vapor mixture in the flammable range, means shall be provided to stop the propagation of flame through the vapor collection system. The means chosen shall prevent flame propagation under the conditions with which they will be used.

19.5.7.7 Explosion Protection. Where used, explosion protection systems shall comply with NFPA 69, *Standard on Explosion Prevention Systems*.

19.5.8 Emergency Shutdown Systems. Emergency shutdown systems shall be designed to fail to a safe position in the event of loss of normal system power (i.e., air or electric) or equipment malfunction.

19.6 Solvent Distillation Units.

19.6.1 Scope.

19.6.1.1 This section shall apply to solvent distillation units having distillation chambers or still pots that do not exceed 60 gal (227 L) nominal capacity and are used to recycle Class I, Class II, or Class IIIA liquids.

19.6.1.2 This section shall not apply to research, testing, or experimental processes; to distillation processes carried out in petroleum refineries, chemical plants, or distilleries; or to distillation equipment used in dry cleaning operations.

19.6.2 Equipment. Solvent distillation units shall be approved or shall be listed in accordance with ANSI/UL 2208, *Standard for Solvent Distillation Units.*

19.6.3 Solvents. Solvent distillation units shall only be used to distill liquids for which they have been investigated and that are listed on the unit’s marking or contained within the manufacturers’ literature.

19.6.3.1 Unstable or reactive liquids or materials shall not be processed unless they have been specifically listed on the system’s markings or contained within the manufacturer’s literature.

19.6.4 Location.

19.6.4.1 Solvent distillation units shall be located and operated in locations in accordance with their approval or listing.

19.6.4.2 Solvent distillation units shall not be used in basements.

19.6.4.3 Solvent distillation units shall be located away from potential sources of ignition, as indicated on the unit’s marking.

19.6.5 Liquid Storage. Distilled liquids and liquids awaiting distillation shall be stored in accordance with this code.

Chapter 20 Reserved

Chapter 21 Storage of Liquids in Tanks — Requirements for All Storage Tanks

21.1 Scope.

This chapter shall apply to the following:

(1) The storage of flammable and combustible liquids, as defined in 3.3.30 and Chapter 4, in fixed tanks that exceed 60 gal (230 L) capacity

(2) The storage of flammable and combustible liquids in portable tanks and bulk containers whose capacity exceeds 793 gal (3000 L)

(3) The design, installation, testing, operation, and maintenance of such tanks, portable tanks, and bulk containers

21.2 Definitions Specific to Chapter 21.

For the purpose of this chapter, the following terms shall be defined as shown.

21.2.1 Compartmented Tank. A tank that is divided into two or more compartments intended to contain the same or different liquids.

21.3 General Requirements.

21.3.1 Tanks shall be permitted to be of any shape, size, or type consistent with recognized engineering standards. Metal tanks shall be welded, riveted and caulked, or bolted or constructed using a combination of these methods.

21.3.2 Tanks designed and intended for aboveground use shall not be used as underground tanks.

21.3.3 Tanks designed and intended for underground use shall not be used as aboveground tanks.

21.3.4 Tanks shall be designed and built in accordance with recognized engineering standards for the material of construction being used.

21.4 Design and Construction of Storage Tanks.

21.4.1 Materials of Construction. Tanks shall be of steel or other approved noncombustible material and shall meet the applicable requirements of 21.4.1.1 through 21.4.1.5.

21.4.1.1 The materials of construction for tanks and their appurtenances shall be compatible with the liquid to be stored. In case of doubt about the properties of the liquid to be stored, the supplier, producer of the liquid, or other competent authority shall be consulted.

21.4.1.2 Tanks shall be permitted to be constructed of combustible materials when approved. Tanks constructed of combustible materials shall be limited to any of the following:

(1) Underground installation

(2) Use where required by the properties of the liquid stored

(3) Aboveground storage of Class IIIB liquids in areas not exposed to a spill or leak of Class I or Class II liquid

(4) Storage of Class IIIB liquids inside a building protected by an approved automatic fire-extinguishing system

21.4.1.3 Unlined concrete tanks shall be permitted to be used for storing liquids that have a gravity of 40° API or heavier. Concrete tanks with special linings shall be permitted to be used for other liquids, provided they are designed and constructed in accordance with recognized engineering standards.

21.4.1.4 Tanks shall be permitted to have combustible or noncombustible linings. The choice of the lining material and its required thickness shall depend on the properties of the liquid to be stored.

21.4.1.5 An engineering evaluation shall be made if the specific gravity of the liquid to be stored exceeds that of water or if the tank is designed to contain liquids at a liquid temperature below 0°F (-18°C).

21.4.2 Design Standards for Storage Tanks.

21.4.2.1 Design Standards for Atmospheric Tanks.

21.4.2.1.1* Atmospheric tanks shall be designed and constructed in accordance with recognized engineering standards. Atmospheric tanks that meet any of the following standards shall be deemed as meeting the requirements of 21.4.2.1:

(1) API Specification 12B, *Bolted Tanks for Storage of Production Liquids*

(2) API Specification 12D, *Field Welded Tanks for Storage of Production Liquids*

(3) API Specification 12F, *Shop Welded Tanks for Storage of Production Liquids*

(4) API Standard 650, *Welded Steel Tanks for Oil Storage*

(5) UL 58, *Standard for Steel Underground Tanks for Flammable and Combustible Liquids*

(6) ANSI/UL 80, *Standard for Steel Tanks for Oil Burner Fuel*

(7) ANSI/UL 142, *Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids*

(8) ANSI/UL 1316, *Standard for Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures*

(9) ANSI/UL 1746, *Standard for External Corrosion Protection Systems for Steel Underground Storage Tanks*

(10) UL 2080, *Standard for Fire Resistant Tanks for Flammable and Combustible Liquids*

(11) ANSI/UL 2085, *Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids*

21.4.2.1.2 Except as provided for in 21.4.2.1.3 and 21.4.2.1.4, atmospheric tanks designed and constructed in accordance with Appendix F of API Standard 650, *Welded Steel Tanks for Oil Storage*, shall be permitted to operate at pressures from atmospheric to a gauge pressure of 1.0 psi (6.9 kPa). All other tanks shall be limited to operation from atmospheric to a gauge pressure of 0.5 psi (3.5 kPa).

21.4.2.1.3 Atmospheric tanks that are not designed and constructed in accordance with Appendix F of API Standard 650, *Welded Steel Tanks for Oil Storage*, shall be permitted to operate at pressures from atmospheric to a gauge pressure of 1.0 psi (6.9 kPa) only if an engineering analysis is performed to determine that the tank can withstand the elevated pressure.

21.4.2.1.4 Horizontal cylindrical and rectangular tanks built according to any of the standards specified in 21.4.2.1.1 shall be permitted to operate at pressures from atmospheric to a gauge pressure of 1.0 psi (6.9 kPa) and shall be limited to a gauge pressure of 17 kPa (2.5 psi) under emergency venting conditions.

21.4.2.1.5 Low-pressure tanks and pressure vessels shall be permitted to be used as atmospheric tanks.

21.4.2.1.6 Atmospheric tanks shall not be used to store a liquid at a temperature at or above its boiling point.

21.4.2.2 Design Standards for Low-Pressure Tanks.

21.4.2.2.1 Low-pressure tanks shall be designed and constructed in accordance with recognized engineering standards. Low-pressure tanks that meet either of the following standards shall be deemed as meeting the requirements of 21.4.2.2:

(1) API 620, *Recommended Rules for the Design and Construction of Large, Welded, Low-Pressure Storage Tanks*

(2) ASME *Code for Unfired Pressure Vessels*, Section VIII, Division 1

21.4.2.2.2 Low-pressure tanks shall not be operated above their design pressures.

21.4.2.2.3 Pressure vessels shall be permitted to be used as low-pressure tanks.

21.4.2.3 Design Standards for Pressure Vessels.

21.4.2.3.1 Tanks with storage pressures above a gauge pressure of 15 psi (100 kPa) shall be designed and constructed in accordance with recognized engineering standards. Pressure vessels that meet any of the following standards shall be deemed as meeting the requirements of 21.4.2.3:

(1) Fired pressure vessels shall be designed and constructed in accordance with Section I (Power Boilers), or Section VIII, Division 1 or Division 2 (Pressure Vessels), as applicable, of the ASME *Boiler and Pressure Vessel Code*.

(2) Unfired pressure vessels shall be designed and constructed in accordance with Section VIII, Division 1 or Division 2, of the ASME *Boiler and Pressure Vessel Code*.

21.4.2.3.2* Pressure vessels that do not meet the requirements of 21.4.2.3.1(1) or 21.4.2.3.1(2) shall be permitted to be used, provided they are approved.

21.4.2.3.3 Pressure vessels shall not be operated above their design pressures. The normal operating pressure of the vessel shall not exceed the design pressure of the vessel.

21.4.3 Normal Venting for Storage Tanks.

21.4.3.1 Atmospheric storage tanks shall be vented to prevent the development of vacuum or pressure that can distort the roof of a cone roof tank or that exceeds the design pressure of other atmospheric tanks when filling or emptying the tank or because of atmospheric temperature changes.

21.4.3.2 Normal vents shall be sized in accordance with either API Standard 2000, *Venting Atmospheric and*

Low-Pressure Storage Tanks, or another approved standard. Alternatively, the normal vent shall be at least as large as the largest filling or withdrawal connection but in no case shall it be less than 1.25 in. (32 mm) nominal inside diameter.

21.4.3.3 Low-pressure tanks and pressure vessels shall be vented to prevent the development of pressure or vacuum that exceeds the design pressure of the tank or vessel when filling or emptying the tank or vessel or because of atmospheric temperature changes. Means shall also be provided to prevent overpressure from any pump discharging into the tank or vessel when the pump discharge pressure can exceed the design pressure of the tank or vessel.

21.4.3.4 If any tank or pressure vessel has more than one fill or withdrawal connection and simultaneous filling or withdrawal can be made, the vent size shall be based on the maximum anticipated simultaneous flow.

21.4.3.5 For tanks equipped with vents that permit pressures to exceed a gauge pressure of 2.5 psi (17 kPa) and for low-pressure tanks and for pressure vessels, the outlet of all vents and vent drains shall be arranged to discharge in a manner that prevents localized overheating of or flame impingement on any part of the tank, if vapors from the vents are ignited.

21.4.3.6 Tanks and pressure vessels that store Class IA liquids shall be equipped with venting devices that are closed, except when venting under pressure or vacuum conditions.

21.4.3.7 Tanks and pressure vessels that store Class IB and Class IC liquids shall be equipped with venting devices or with listed flame arresters. When used, vent devices shall be closed, except when venting under pressure or vacuum conditions.

21.4.3.8 Tanks of 3000 barrels (bbl) (126,000 gal or 475 m^3) capacity or less that store crude petroleum in crude-producing areas and outside aboveground atmospheric tanks of less than 1000 gal (3785 L) capacity that contain other than Class IA liquids shall be permitted to have open vents.

21.4.3.9* Flame arresters or venting devices required in 21.4.3.6 and 21.4.3.7 shall be permitted to be omitted on tanks that store Class IB or Class IC liquids where conditions are such that their use can, in case of obstruction, result in damage to the tank.

21.4.3.10 Piping for normal vents shall be designed in accordance with Chapter 27.

21.4.4* Tank Openings Other than Vents. Fill pipes that enter the top of a tank shall terminate within 6 in. (150 mm) of the bottom of the tank. Fill pipes shall be installed or arranged so that vibration is minimized.

Exception No. 1: Fill pipes in tanks whose vapor space under the expected range of operating conditions is not in the flammable range or is inerted need not meet this requirement.

Exception No. 2: Fill pipes in tanks handling liquids with minimal potential for accumulation of static charge need not meet this requirement, provided that the fill line is designed and the system is operated to avoid mist generation and to provide residence time downstream of filters or screens to allow dissipation of the generated static charge.

21.4.5* Corrosion Protection.

21.4.5.1 Corrosion protection shall meet the requirements of 21.4.5.2 or 21.4.5.3, whichever is applicable.

21.4.5.2 Internal Corrosion Protection for Metal Storage Tanks. Where tanks are not designed in accordance with standards of the American Petroleum Institute, the American Society of Mechanical Engineers, or Underwriters

Laboratories Inc., or if corrosion is anticipated beyond that provided for in the design formulas or standards used, additional metal thickness or approved protective coatings or linings shall be provided to compensate for the corrosion loss expected during the design life of the tank.

21.4.5.3 Internal Corrosion Protection for Nonmetallic Tanks. Where tanks are not designed in accordance with standards of the American Petroleum Institute, the American Society of Mechanical Engineers, ASTM International, or Underwriters Laboratories Inc., or if degradation is anticipated beyond that provided for in the design formulas or standards used, degradation shall be compensated for by additional material thickness or application of protective coatings or linings.

21.5 Testing Requirements for Tanks.

21.5.1 Initial Testing. All tanks, whether shop-built or field-erected, shall be tested before they are placed in service in accordance with the requirements of the code under which they were built.

21.5.1.1 An approved listing mark on a tank shall be considered to be evidence of compliance with this requirement. Tanks not so marked shall be tested before they are placed in service in accordance with recognized engineering standards or in accordance with the requirements for testing in the codes listed in 21.4.2.1.1, 21.4.2.2.1, or 21.4.2.3.1.

21.5.1.2 Where the vertical length of the fill and vent pipes is such that, when filled with liquid, the static head imposed on the bottom of the tank exceeds a gauge pressure of 10 psi (70 kPa), the tank and its related piping shall be tested hydrostatically to a pressure equal to the static head thus imposed by using recognized engineering standards.

21.5.1.3 Before the tank is initially placed in service, all leaks or deformations shall be corrected in an approved manner. Mechanical caulking shall not be permitted for correcting leaks in welded tanks except for pinhole leaks in the roof.

21.5.1.4 Tanks to be operated at pressures below their design pressure shall be tested by the applicable provisions of 21.5.1.1 or 21.5.1.2 based upon the pressure developed under full emergency venting of the tank.

21.5.2* Tightness Testing. In addition to the tests called for in 21.5.1, all tanks and connections shall be tested for tightness after installation and before being placed in service in accordance with 21.5.2.1 through 21.5.2.7, as applicable. Except for underground tanks, this test shall be made at operating pressure with air, inert gas, or water.

21.5.2.1 Air pressure shall not be used to test tanks that contain flammable or combustible liquids or vapors. *(See Section 27.7 for testing pressure piping.)*

21.5.2.2 For field-erected tanks, the tests required by 21.5.1.1 or 21.5.1.2 shall be permitted to be considered the test for tank tightness.

21.5.2.3 Horizontal shop-fabricated aboveground tanks shall be tested for tightness either hydrostatically or with air pressure at not less than a gauge pressure of 3 psi (20 kPa) and not more than a gauge pressure of 5 psi (35 kPa).

21.5.2.4 Vertical shop-fabricated aboveground tanks shall be tested for tightness either hydrostatically or with air pressure at not less than a gauge pressure of 1.5 psi (10 kPa) and not more than a gauge pressure of 2.5 psi (17 kPa).

21.5.2.5 Single-wall underground tanks and piping, before being covered, enclosed, or placed in use, shall be tested for tightness either hydrostatically or with air pressure at not less than a gauge pressure of 3 psi (20 kPa) and not more than a gauge pressure of 5 psi (35 kPa).

21.5.2.6* Underground secondary containment tanks and horizontal aboveground secondary containment tanks shall have the primary (inner) tank tested for tightness either hydrostatically or with air pressure at not less than a gauge pressure of 3 psi (20 kPa) and not more than a gauge pressure of 5 psi (35 kPa).

21.5.2.6.1 The interstitial space (annulus) of such tanks shall be tested either hydrostatically or with air pressure at a gauge pressure of 3 to 5 psi (20 to 35 kPa) by vacuum at 2.6 psi (18 kPa), or in accordance with the tank's listing or the manufacturer's instructions. These limits shall not be exceeded.

21.5.2.6.2 The pressure or vacuum shall be held for not less than 1 hour or for the duration specified in the listing procedures for the tank.

21.5.2.7 Vertical aboveground secondary containment–type tanks shall have their primary (inner) tank tested for tightness either hydrostatically or with air pressure at not less than a gauge pressure of 1.5 psi (10 kPa) and not more than a gauge pressure of 2.5 psi (17 kPa).

21.5.2.7.1 The interstitial space (annulus) of such tanks shall be tested either hydrostatically or with air pressure at a gauge pressure of 1.5 to 2.5 psi (10 to 17 kPa), by vacuum at 5.3 in. Hg (18 kPa), or in accordance with the tank's listing or manufacturer's instructions. These limits shall not be exceeded.

21.5.2.7.2 The pressure or vacuum shall be held for not less than 1 hour or for the duration specified in the listing procedures for the tank.

21.5.3* Periodic Testing. Each tank shall be tested when required by the manufacturer's instructions and applicable standards to ensure the integrity of the tank.

21.6 Fire Prevention and Control.

21.6.1 General Requirements.

21.6.1.1 This section shall apply to the commonly recognized management techniques and fire control methods used to prevent or minimize the loss from fire or explosion in tank storage facilities. The wide range in size, design, and location of tank storage facilities shall preclude the inclusion of detailed fire prevention and control methods applicable to all such facilities.

21.6.1.2 Tank storage facilities shall have fire prevention and control for life safety, for minimizing property loss, and for reducing fire exposure to adjoining facilities resulting from fire and explosion. Compliance with 21.6.2 through 21.6.6 shall be deemed as meeting the requirements of 21.6.1.

21.6.2 Control of Ignition Sources. In order to prevent the ignition of flammable vapors in tank storage facilities, ignition sources shall be controlled in accordance with Chapter 6.

21.6.3 Management of Fire Hazards. The extent of fire prevention and control provided for tank storage facilities shall be determined by an engineering evaluation of the installation and operation, followed by the application of sound fire protection and process engineering principles. The evaluation shall include, but not be limited to, the following:

(1) Analysis of fire and explosion hazards of the facility

(2) Analysis of local conditions, such as exposure to and from adjacent properties, flood potential, or earthquake potential

(3) Fire department or mutual aid response

21.6.4 Fire Control. Tank storage facilities for flammable and combustible liquids shall be reviewed to ensure that fire and explosion hazards resulting from loss of containment of liquids are provided with corresponding fire prevention and emergency action plans. *(See also Section 6.3.)*

21.6.5 Emergency Planning and Training.

21.6.5.1 An emergency plan, consistent with the available equipment and personnel, shall be established to respond to fire or other emergencies. This plan shall address the following:

(1) Procedures to be used in case of fire, such as sounding the alarm, notifying the fire department, evacuating personnel, and controlling and extinguishing the fire

(2) Appointment and training of persons to carry out fire safety duties

(3) Maintenance of fire protection equipment

(4) Holding fire drills

(5) Shutdown or isolation of equipment to control unintentional releases

(6) Alternate measures for the safety of personnel while any fire protection equipment is shut down

21.6.5.2 Personnel responsible for the use and operation of fire protection equipment shall be trained in the use of and be able to demonstrate knowledge of the use or operation of that equipment. Refresher training shall be conducted at least annually.

21.6.5.3 Planning of effective fire control measures shall be coordinated with local emergency response agencies and shall include, but not be limited to, the identification of all tanks by location, contents, size, and hazard identification as required in 21.7.2.1.

21.6.5.4 Procedures shall be established to provide for safe shutdown of tank storage facilities under emergency conditions. These procedures shall provide requirements for periodic training and inspection, and testing of associated alarms, interlocks, and controls.

21.6.5.5 Emergency procedures shall be kept available in an operating area. The procedures shall be reviewed and updated whenever conditions change.

21.6.5.6 Where tank storage facilities are unattended, a summary of the emergency plan shall be posted or located in a strategic location that is accessible to emergency responders.

21.6.6 Inspection and Maintenance of Fire Protection Equipment.

21.6.6.1* All fire protection equipment shall be maintained, inspected, and tested in accordance with regulatory requirements, standard practices, and equipment manufacturers' recommendations.

21.6.6.2 Maintenance and operating practices at tank storage facilities shall control leakage and prevent spillage of liquids.

21.6.6.3 Ground areas around tank storage facilities shall be kept free of weeds, trash, or other unnecessary combustible materials.

21.6.6.4 Accessways established for movement of personnel shall be maintained clear of obstructions to permit evacuation and access for manual fire fighting in accordance with regulatory requirements and the emergency plan.

21.6.6.5 Combustible waste material and residues in operating areas shall be kept to a minimum, stored in covered metal containers, and disposed of daily.

21.7 Operation of Storage Tanks.

21.7.1* Prevention of Overfilling of Storage Tanks. Facilities with aboveground tanks larger than 1320 gal (5000 L) storing Class I or Class II liquids shall establish procedures or shall provide equipment, or both, to prevent overfilling of tanks.

21.7.1.1 Facilities with aboveground tanks that receive and transfer Class I liquids from mainline pipelines or marine vessels shall establish and follow formal written procedures to prevent overfilling of tanks utilizing one of the following methods of protection:

(1) Tanks shall be gauged at intervals in accordance with established procedures by personnel continuously on the premises during product receipt. Acknowledged communication shall be maintained with the supplier so flow can be shut down or diverted in accordance with established procedures.

(2) Tanks shall be equipped with a high-level detection device that is either independent of any gauging equipment or incorporates a gauging and alarm system that provides electronic self-checking to indicate when the gauging and alarm system has failed. Alarms shall be located where personnel who are on duty throughout product transfer can arrange for flow stoppage or diversion in accordance with established procedures.

(3) Tanks shall be equipped with an independent high-level detection system that will automatically shut down or divert flow in accordance with established procedures.

21.7.1.2 Alternatives to instrumentation described in 21.7.1.1(2) and 21.7.1.1(3) shall be allowed where approved as affording equivalent protection.

21.7.1.3 Instrumentation systems covered in 21.7.1.1(2) and 21.7.1.1(3) shall be wired fail-safe, such that valid alarm conditions or system failures create an alarm condition that will notify personnel or automatically shut down or divert flow.

21.7.1.3.1 Written instrumentation performance procedures shall be established to define valid alarm conditions and system failures in accordance with API 2350, *Overfill Protection for Storage Tanks in Petroleum Facilities*.

21.7.1.3.2 System failure shall include but not be limited to the following:

(1) Loss of main electrical power

(2) Electrical break, short circuit, or ground fault in the level detection system circuit or the alarm and signal circuit

(3) Failure or malfunction of the level detection system control equipment or signaling devices

21.7.1.4 Formal written procedures required by 21.7.1.1 shall include the following:

(1) Instructions covering methods to check for lineup and receipt of initial delivery to tank designated to receive shipment.

(2) Provision for training and monitoring the performance of operating personnel by supervisors.

(3) Schedules and procedures for inspection and testing of gauging equipment and high-level instrumentation and related systems. Inspection and testing intervals shall be approved but shall not exceed 1 year.

21.7.1.5 An underground tank shall be equipped with overfill prevention equipment that will operate as follows:

(1) Automatically shut off the flow of liquid into the tank when the tank is no more than 95 percent full

(2) Alert the transfer operator when the tank is no more than 90 percent full by restricting the flow of liquid into the tank or triggering the high-level alarm

(3) Other approved methods

21.7.1.6 Shop-fabricated aboveground atmospheric storage tanks, constructed to the recognized standards of 21.4.2.1.1(1), shall meet the requirements of 21.7.1.6.1 through 21.7.1.6.4 whenever the vertical length from the tank bottom to the top of the fill, normal vent, or emergency vent exceeds 12 ft (3.7 m).

21.7.1.6.1 An approved means shall be provided to notify the tank filling operator of the pending completion of the tank fill operation at the fill connection.

21.7.1.6.2 An approved means shall be provided to stop delivery of liquid to the tank prior to the complete filling of the tank.

21.7.1.6.3 In no case shall these provisions restrict or interfere with the functioning of the normal vent or emergency vent.

21.7.1.6.4 The manufacturer of the tank shall be consulted to determine if reinforcement of the tank is required. If reinforcement is deemed necessary, it shall be done.

21.7.2 Identification and Security.

21.7.2.1 Identification for Emergency Responders. A sign or marking that meets the requirements of NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, or another approved system, shall be applied to storage tanks containing liquids. The marking shall be located where it can be seen, such as on the side of the tank, the shoulder of an accessway or walkway to the tank or tanks, or on the piping outside of the diked area. If more than one tank is involved, the markings shall be so located that each tank can be identified.

21.7.2.2 Security for Unsupervised Storage Tanks. Unsupervised, isolated aboveground storage tanks shall be secured and shall be marked to identify the fire hazards of the tank and the tank's contents to the general public. Where necessary to protect the tank from tampering or trespassing, the area where the tank is located shall be secured.

21.7.3 Storage Tanks in Areas Subject to Flooding.

21.7.3.1 Water Loading.

21.7.3.1.1 The filling of a tank to be protected by water loading shall be started as soon as floodwaters are predicted to reach a dangerous flood stage.

21.7.3.1.2 Where independently fueled water pumps are relied on, sufficient fuel shall be available at all times to permit continuing operations until all tanks are filled.

21.7.3.1.3 Tank valves shall be locked in a closed position when water loading has been completed.

21.7.3.2 Operating Instructions. Operating instructions or procedures to be followed in a flood emergency shall be available to personnel identified in 21.7.3.3.

21.7.3.3 Personnel Training. Personnel relied on to carry out flood emergency procedures shall be informed of the location and operation of valves and other equipment necessary to effect the intent of these requirements.

21.7.4 Removal from Service of Storage Tanks.

21.7.4.1* Closure of Aboveground Storage Tanks. Aboveground tanks taken out of service or abandoned shall be emptied of liquid, rendered vapor-free, and safeguarded against trespassing in accordance with NFPA 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair*, or in accordance with the requirements of the authority having jurisdiction.

21.7.4.2 Reuse of Aboveground Storage Tanks. Aboveground tanks shall be permitted to be reused for flammable or combustible liquids service provided they comply with applicable sections of this code and are approved.

21.7.4.3 Removal from Service of Underground Storage Tanks.

21.7.4.3.1 General. Underground tanks taken out of service or abandoned shall be emptied of liquid, rendered vapor-free, and safeguarded against trespassing in accordance with this section and in accordance with NFPA 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair*, or in accordance with the requirements of the authority having jurisdiction. The procedures outlined in this section shall be followed when taking underground tanks temporarily out of service, closing them in place permanently, or removing them. *(See Annex C for additional information.)*

21.7.4.3.2 Temporary Closure. Underground tanks shall be rendered temporarily out of service only when it is planned that they will be returned to active service, closed in place permanently, or removed within an approved period not exceeding 1 year. The following requirements shall be met:

(1) Corrosion protection and release detection systems shall be maintained in operation.

(2) The vent line shall be left open and functioning.

(3) The tank shall be secured against tampering.

(4) All other lines shall be capped or plugged.

21.7.4.3.2.1 Tanks remaining temporarily out of service for more than 1 year shall be permanently closed in place or removed in accordance with 21.7.4.3.3 or 21.7.4.3.4, as applicable.

21.7.4.3.3 Permanent Closure in Place. Underground tanks shall be permitted to be permanently closed in place if approved by the authority having jurisdiction. All of the following requirements shall be met:

(1) All applicable authorities having jurisdiction shall be notified.

(2)* A safe workplace shall be maintained throughout the prescribed activities.

(3) All flammable and combustible liquids and residues shall be removed from the tank, appurtenances, and piping and shall be disposed of in accordance with regulatory requirements and industry practices, using a written procedure.

(4) The tank, appurtenances, and piping shall be made safe by either purging them of flammable vapors or inerting the potential explosive atmosphere. Confirmation that the atmosphere in the tank is safe shall be by testing of the atmosphere using a combustible gas indicator if purging, or an oxygen meter if inerting, at intervals in accordance with written procedures.

(5) Access to the tank shall be made by careful excavation to the top of the tank.

(6) All exposed piping, gauging and tank fixtures, and other appurtenances, except the vent, shall be disconnected and removed.

(7) The tank shall be completely filled with an inert solid material.

(8) The tank vent and remaining underground piping shall be capped or removed.

(9) The tank excavation shall be backfilled.

21.7.4.3.4 Removal and Disposal. Underground tanks and piping shall be removed in accordance with the following requirements:

(1) The steps described in 21.7.4.3.3(1) through 21.7.4.3.3(5) shall be followed.

(2) All exposed piping, gauging and tank fixtures, and other appurtenances, including the vent, shall be disconnected and removed.

(3) All openings shall be plugged, leaving a ¼ in. (6 mm) opening to avoid buildup of pressure in the tank.

(4) The tank shall be removed from the excavated site and shall be secured against movement.

(5) Any corrosion holes shall be plugged.

(6) The tank shall be labeled with its former contents, present vapor state, vapor-freeing method, and a warning against reuse.

(7) The tank shall be removed from the site as authorized by the authority having jurisdiction, preferably the same day.

21.7.4.3.5 Temporary Storage of Removed Tanks. If it is necessary to temporarily store an underground tank that has been removed, it shall be placed in a secure area where public access is restricted. A ¼ in. (6 mm) opening shall be maintained to avoid buildup of pressure in the tank.

21.7.4.3.6 Disposal of Tanks. Disposal of underground tanks shall meet the following requirements:

(1) Before a tank is cut up for scrap or landfill, the atmosphere in the tank shall be tested in accordance with

21.7.4.3.3(4) to ensure that it is safe.

(2) The tank shall be made unfit for further use by cutting holes in the tank heads and shell.

21.7.4.3.7 Documentation. All necessary documentation shall be prepared and maintained in accordance with all federal, state, and local rules and regulations.

21.7.4.3.8 Reuse of Underground Storage Tanks. Underground tanks shall be permitted to be reused for underground storage of flammable or combustible liquids provided they comply with applicable sections of this code and are approved.

21.7.4.3.9 Change of Service of Underground Storage Tanks. Underground tanks that undergo any change of stored product shall be re-evaluated for compliance with Chapter 21.

21.7.5* Leak Detection and Inventory Records for Underground Storage Tanks. Accurate inventory records or a leak detection program shall be maintained on all Class I liquid storage tanks for indication of leakage from the tanks or associated piping.

21.8 Inspection and Maintenance of Storage Tanks and Storage Tank Appurtenances.

21.8.1* Each storage tank constructed of steel shall be inspected and maintained in accordance with API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction*, or STI SP001, *Standard for the Inspection of Aboveground Storage Tanks*, whichever is applicable.

21.8.2 Each storage tank constructed of other materials shall be inspected and maintained in accordance with the manufacturers' instructions and applicable standards to ensure compliance with the requirements of this code.

21.8.3 Testing of storage tanks shall meet the requirements of Section 21.5.

21.8.4 Each storage tank shall be maintained liquidtight. Each storage tank that is leaking shall be emptied of liquid or repaired in a manner acceptable to the authority having jurisdiction.

21.8.5 Each storage tank that has been structurally damaged, repaired, reconstructed, relocated, jacked, or damaged by impact, flood, or other trauma, or is suspected of leaking shall be inspected and tested in accordance with Section 21.5 or in a manner acceptable to the authority having jurisdiction.

21.8.6* Storage tanks and their appurtenances, including normal vents, emergency vents, overfill prevention devices, and related devices shall be maintained to ensure that they function as intended in accordance with written procedures.

21.8.7 Openings for gauging on storage tanks storing Class I liquids shall be provided with a vaportight cap or cover. Such covers shall be closed when not gauging.

21.8.8* Facilities with aboveground storage tanks shall establish a procedure for checking and removal of water from the bottom of storage tanks that contain nonmiscible liquids.

Chapter 22 Storage of Liquids in Tanks — Aboveground Storage Tanks

22.1 Scope.

This chapter shall apply to the following:

(1) The storage of flammable and combustible liquids, as defined in 3.3.30 and Chapter 4, in fixed aboveground storage tanks as defined in 3.3.47.1

(2) The storage of flammable and combustible liquids in portable tanks and bulk containers whose capacity exceeds 793 gal (3000 L)

(3) The installation and operation of such tanks, portable tanks, and bulk containers

22.2 Definitions Specific to Chapter 22.

For the purpose of this chapter, the following terms shall be defined as shown.

22.2.1 Floating Roof Tank. An aboveground storage tank that incorporates one of the following designs:

(1) A closed-top pontoon or double-deck metal floating roof in an open-top tank constructed in accordance with API Standard 650, *Welded Steel Tanks for Oil Storage*

(2) A fixed metal roof with ventilation at the top and roof eaves constructed in accordance with API Standard 650 and containing a closed-top pontoon or double-deck metal floating roof meeting the requirements of API Standard 650

(3) A fixed metal roof with ventilation at the top and roof eaves constructed in accordance with API Standard 650 and containing a metal floating cover supported by liquidtight metal floating devices that provide buoyancy to prevent the liquid surface from being exposed when half of the flotation is lost

22.2.1.1 For the purposes of this chapter, an aboveground storage tank with an internal metal floating pan, roof, or cover that does not meet 22.2.1 or one that uses plastic foam (except for seals) for flotation, even if encapsulated in metal or fiberglass, shall meet the requirements for a fixed roof tank.

22.3 Reserved.

22.4* Location of Aboveground Storage Tanks.

22.4.1 Location with Respect to Property Lines, Public Ways, and Important Buildings.

22.4.1.1 Tanks storing Class I, Class II, or Class IIIA stable liquids whose internal pressure is not permitted to exceed a gauge pressure of 2.5 psi (17 kPa) shall be located in accordance with Table 22.4.1.1(a) and Table 22.4.1.1(b). Where tank spacing is based on a weak roof-to-shell seam design, the user shall present evidence certifying such construction to the authority having jurisdiction upon request.

Table 22.4.1.1(a) Location of Aboveground Storage Tanks Storing Stable Liquids — Internal Pressure Not to Exceed a Gauge Pressure of 2.5 psi (17 kPa)

	Minimum Distance (ft)

22.4.1.1 Tanks storing Class I, Class II, or Class IIIA stable liquids whose internal pressure is not permitted to exceed a gauge pressure of 2.5 psi (17 kPa) shall be located in accordance with Table 22.4.1.1(a) and Table 22.4.1.1(b). Where tank spacing is based on a weak roof-to-shell seam design, the user shall present evidence certifying such construction to the authority having jurisdiction upon request.

Table 22.4.1.1(a) Location of Aboveground Storage Tanks Storing Stable Liquids — Internal Pressure Not to Exceed a Gauge Pressure of 2.5 psi (17 kPa)

		Minimum Distance (ft)	
Type of Tank	**Protection**	**From Property Line That Is or Can Be Built Upon, Including the Opposite Side of a Public Way[a]**	**From Nearest Side of Any Public Way or from Nearest Important Building on the Same Property[a]**
Floating roof	Protection for exposures[b]	½ × diameter of tank	⅙ × diameter of tank
	None	Diameter of tank but need not exceed 175 ft	⅙ × diameter of tank
Vertical with weak roof-to-shell seam	Approved foam or inerting system[c] on tanks not exceeding 150 ft in diameter[d]	½ × diameter of tank	⅙ × diameter of tank
	Protection for exposures[b]	Diameter of tank	⅓ × diameter of tank
	None	2 × diameter of tank but need not exceed 350 ft	⅓ × diameter of tank
Horizontal and vertical tanks with emergency relief venting to limit pressures to 2.5 psi (gauge pressure of 17 kPa)	Approved inerting system[b] on the tank or approved foam system on vertical tanks	½ × value in Table 22.4.1.1(b)	½ × value in Table 22.4.1.1(b)
	Protection for exposures[b]	Value in Table 22.4.1.1(b)	Value in Table 22.4.1.1(b)
	None	2 × value in Table 22.4.1.1(b)	Value in Table 22.4.1.1(b)
Protected aboveground tank	None	½ × value in Table 22.4.1.1(b)	½ × value in Table 22.4.1.1(b)

For SI units, 1 ft = 0.3 m.

[a]The minimum distance cannot be less than 5 ft (1.5 m).

[b]See definition 3.3.42, Protection for Exposures.

[c]See NFPA 69, *Standard on Explosion Prevention Systems*.

[d]For tanks over 150 ft (45 m) in diameter, use “Protection for Exposures” or “None,” as applicable.

Table 22.4.1.1(b) Reference Table for Use with Tables 22.4.1.1(a), 22.4.1.3, and 22.4.1.5

	Minimum Distance (ft)	
Tank Capacity (gal)	**From Property Line That Is or Can Be Built Upon, Including the Opposite Side of a Public Way**	**From Nearest Side of Any Public Way or from Nearest Important Building on the Same Property**

Table 22.4.1.1(b) Reference Table for Use with Tables 22.4.1.1(a), 22.4.1.3, and 22.4.1.5

Tank Capacity (gal)	Minimum Distance (ft): From Property Line That Is or Can Be Built Upon, Including the Opposite Side of a Public Way	Minimum Distance (ft): From Nearest Side of Any Public Way or from Nearest Important Building on the Same Property
275 or less	5	5
276 to 750	10	5
751 to 12,000	15	5
12,001 to 30,000	20	5
30,001 to 50,000	30	10
50,001 to 100,000	50	15
100,001 to 500,000	80	25
500,001 to 1,000,000	100	35
1,000,001 to 2,000,000	135	45
2,000,001 to 3,000,000	165	55
3,000,001 or more	175	60

For SI units, 1 ft = 0.3 m; 1 gal = 3.8 L.

22.4.1.2 Vertical tanks with weak roof-to-shell seams (see 22.7.2) that store Class IIIA liquids shall be permitted to be located at one-half the distances specified in Table 22.4.1.1(a), provided the tanks are not within the same diked area as, or within the drainage path of, a tank storing a Class I or Class II liquid.

22.4.1.3 Tanks storing Class I, Class II, or Class IIIA stable liquids and operating at pressures that exceed a gauge pressure of 2.5 psi (17 kPa), or are equipped with emergency venting that will permit pressures to exceed a gauge pressure of 2.5 psi (17 kPa), shall be located in accordance with Table 22.4.1.3 and Table 22.4.1.1(b).

Table 22.4.1.3 Location of Aboveground Storage Tanks Storing Stable Liquids — Internal Pressure Permitted to Exceed a Gauge Pressure of 2.5 psi (17 kPa)

Type of Tank	Protection	Minimum Distance (ft): From Property Line that Is or Can Be Built Upon, Including the Opposite Side of a Public Way	Minimum Distance (ft): From Nearest Side of Any Public Way or from Nearest Important Building on the Same Property
Any type	Protection for exposures*	1½ × value in Table 22.4.1.1(b) but not less than 25 ft	1½ × value in Table 22.4.1.1(b) but not less than 25 ft
	None	3 × value in Table 22.4.1.1(b) but not be less than 50 ft	1½ × value in Table 22.4.1.1(b) but not less than 25 ft

For SI units, 1 ft = 0.3 m.

*See definition 3.3.42, Protection for Exposures.

22.4.1.4 Tanks storing liquids with boil-over characteristics shall be located in accordance with Table 22.4.1.4. Liquids with boil-over characteristics shall not be stored in fixed roof tanks larger than 150 ft (45 m) in diameter, unless an approved inerting system is provided on the tank.

Table 22.4.1.4 Location of Aboveground Storage Tanks Storing Boil-Over Liquids

Type of Tank	Protection	Minimum Distance (ft): From Property Line that Is or Can Be Built Upon, Including the Opposite Side of a Public Way[a]	Minimum Distance (ft): From Nearest Side of Any Public Way or from Nearest Important Building on the Same Property[a]
Floating roof	Protection for exposures[b]	½ × diameter of tank	⅙ × diameter of tank
	None	Diameter of tank	⅙ × diameter of tank
Fixed roof	Approved foam or inerting system[c]	Diameter of tank	⅓ × diameter of tank
	Protection for exposures[b]	2 × diameter of tank	⅔ × diameter of tank
	None	4 × diameter of tank but need not exceed 350 ft	⅔ × diameter of tank

For SI units, 1 ft = 0.3 m.

[a]The minimum distance cannot be less than 5 ft.

[b]See definition 3.3.42, Protection for Exposures.

[c]See NFPA 69, *Standard on Explosion Prevention Systems*.

22.4.1.5 Tanks storing unstable liquids shall be located in accordance with Table 22.4.1.5 and Table 22.4.1.1(b).

Table 22.4.1.5 Location of Aboveground Storage Tanks Storing Unstable Liquids

Type of Tank	Protection	Minimum Distance (ft): From Property Line that Is or Can Be Built Upon, Including the Opposite Side of a Public Way	Minimum Distance (ft): From Nearest Side of Any Public Way or from Nearest Important Building on the Same Property[a]
Horizontal and vertical tanks with emergency relief venting to permit pressure not in excess of a gauge pressure of 2.5 psi (17 kPa)	Tank protected with any one of the following: approved water spray, approved inerting,[a] approved insulation and refrigeration, approved barricade	Value in Table 22.4.1.1(b) but not less than 25 ft	Not less than 25 ft
	Protection for exposures[b]	2½ × value in Table 22.4.1.1(b) but not less than 50 ft	Not less than 50 ft
	None	5 × value in Table 22.4.1.1(b) but not less than 100 ft	Not less than 100 ft
Horizontal and vertical tanks with emergency relief venting to permit pressure over a gauge pressure of 2.5 psi (17 kPa)	Tank protected with any one of the following: approved water spray, approved inerting,[a] approved insulation and refrigeration, approved barricade	2 × value in Table 22.4.1.1(b) but not less than 50 ft	Not less than 50 ft
	Protection for exposures[b]	4 × value in Table 22.4.1.1(b) but not less than 100 ft	Not less than 100 ft

Table 22.4.1.5 Location of Aboveground Storage Tanks Storing Unstable Liquids

Type of Tank	Protection	Minimum Distance (ft): From Property Line that Is or Can Be Built Upon, Including the Opposite Side of a Public Way	Minimum Distance (ft): From Nearest Side of Any Public Way or from Nearest Important Building on the Same Property[a]
	None	8 × value in Table 22.4.1.1(b) but not less than 150 ft	Not less than 150 ft

For SI units, 1 ft = 0.3 m.

[a]See NFPA 69, *Standard on Explosion Prevention Systems*.

[b]See definition 3.3.42, Protection for Exposures.

22.4.1.6 Tanks storing Class IIIB stable liquids shall be located in accordance with Table 22.4.1.6.

Exception: If located within the same diked area as, or within the drainage path of, a tank storing a Class I or Class II liquid, the tank storing Class IIIB liquid shall be located in accordance with 22.4.1.1.

Table 22.4.1.6 Location of Aboveground Storage Tanks Storing Class IIIB Liquids

Tank Capacity (gal)	Minimum Distance (ft): From Property Line that Is or Can Be Built Upon, Including the Opposite Side of a Public Way	Minimum Distance (ft): From Nearest Side of Any Public Way or from Nearest Important Building on the Same Property
12,000 or less	5	5
12,001 to 30,000	10	5
30,001 to 50,000	10	10
50,001 to 100,000	15	10
100,001 or more	15	15

For SI units, 1 ft = 0.3 m; 1 gal = 3.8 L.

22.4.1.7 Where two tank properties of diverse ownership have a common boundary, the authority having jurisdiction shall be permitted, with the written consent of the owners of the two properties, to substitute the distances provided in 22.4.2 for the minimum distances set forth in 22.4.1.1.

22.4.1.8 Where end failure of a horizontal pressure tank or vessel can expose property, the tank or vessel shall be placed with its longitudinal axis parallel to the nearest important exposure.

22.4.2 Shell-to-Shell Spacing of Adjacent Aboveground Storage Tanks.

22.4.2.1 Tanks storing Class I, Class II, or Class III stable liquids shall be separated by the distances given in Table 22.4.2.1.

placed with its longitudinal axis parallel to the nearest important exposure.

22.4.2 Shell-to-Shell Spacing of Adjacent Aboveground Storage Tanks.

22.4.2.1 Tanks storing Class I, Class II, or Class III stable liquids shall be separated by the distances given in Table 22.4.2.1.

Table 22.4.2.1 Minimum Shell-to-Shell Spacing of Aboveground Storage Tanks

		Fixed or Horizontal Tanks	
Tank Diameter	Floating Roof Tanks	Class I or II Liquids	Class IIIA Liq
All tanks not over 150 ft (45 m) in diameter	⅙ × sum of adjacent tank diameters but not less than 3 ft (0.9 m)	1/6 × sum of adjacent tank diameters but not less than 3 ft (0.9 m)	⅙ × sum of adjacent tan but not less than 3 ft (0.
Tanks larger than 150 ft (45 m) in diameter:			
If remote impounding is provided in accordance with 22.11.1	⅙ × sum of adjacent tank diameters	¼ × sum of adjacent tank diameters	⅙ × sum of adjacent tan
If open diking is provided in accordance with 22.11.2	¼ × sum of adjacent tank diameters	⅓ × sum of adjacent tank diameters	¼ × sum of adjacent tan

22.4.2.1.1 Tanks that store crude petroleum, have individual capacities not exceeding 3000 bbl (126,000 gal or 480 m^3), and are located at production facilities in isolated locations shall not be required to be separated by more than 3 ft (0.9 m).

22.4.2.1.2 Tanks used only for storing Class IIIB liquids shall not be required to be separated by more than 3 ft (0.9 m) provided they are not within the same diked area as, or within the drainage path of, a tank storing a Class I or Class II liquid. If located within the same diked area as, or within the drainage path of, a tank storing a Class I or Class II liquid, the tank storing Class IIIB liquid shall be spaced in accordance with the requirements for Class IIIA liquids in Table 22.4.2.1.

22.4.2.2 A tank storing unstable liquid shall be separated from any other tank containing either an unstable liquid or a Class I, II, or III liquid by a distance not less than one-half the sum of their diameters.

22.4.2.3 Where tanks are in a diked area containing Class I or Class II liquids or in the drainage path of Class I or Class II liquids and are compacted in three or more rows or in an irregular pattern, greater spacing or other means shall be permitted to be required by the authority having jurisdiction to make tanks in the interior of the pattern accessible for fire-fighting purposes.

22.4.2.4 The minimum horizontal separation between an LP-Gas container and a Class I, Class II, or Class IIIA liquid storage tank shall be 20 ft (6 m).

22.4.2.4.1 Means shall be provided to prevent Class I, Class II, or Class IIIA liquids from accumulating under adjacent LP-Gas containers by means of dikes, diversion curbs, or grading.

22.4.2.4.2 Where flammable or combustible liquid storage tanks are within a diked area, the LP-Gas containers shall be outside the diked area and at least 3 ft (0.9 m) away from the centerline of the wall of the diked area.

22.4.2.5 If a tank storing a Class I, Class II, or Class IIIA liquid operates at pressures exceeding a gauge pressure of 2.5 psi (17 kPa) or is equipped with emergency relief venting that will permit pressures to exceed a gauge pressure of 2.5 psi (17 kPa), it shall be separated from an LP-Gas container by the appropriate distance given in Table 22.4.2.1.

22.4.2.6 The requirements of 22.4.2.4 shall not apply where LP-Gas containers of 125 gal (475 L) or less capacity are installed adjacent to fuel oil supply tanks of 660 gal (2500 L) or less capacity.

22.5 Installation of Aboveground Storage Tanks.

22.5.1 Tank Supports.

22.5.1.1 Tank supports shall be designed and constructed in accordance with recognized engineering standards.

22.5.1.2 Tanks shall be supported in a manner that prevents excessive concentration of loads on the supported portion of the shell.

22.5.1.3 In areas subject to earthquakes, tank supports and connections shall be designed to resist damage as a result of such shocks.

22.5.2 Foundations for and Anchoring of Aboveground Storage Tanks.

22.5.2.1* Tanks shall rest on the ground or on foundations made of concrete, masonry, piling, or steel.

22.5.2.2 Tank foundations shall be designed to minimize the possibility of uneven settling of the tank and to minimize corrosion in any part of the tank resting on the foundation.

22.5.2.3 Where tanks storing Class I, Class II, or Class IIIA liquids are supported above their foundations, tank supports shall be of concrete, masonry, or protected steel.

Exception: Single wood timber supports (not cribbing), laid horizontally, shall be permitted to be used for outside aboveground tanks if not more than 12 in. (300 mm) high at their lowest point.

22.5.2.4* Steel support structures or exposed piling for tanks storing Class I, Class II, or Class IIIA liquids shall be protected by materials having a fire resistance rating of not less than 2 hours.

Exception No. 1: Steel saddles do not need to be protected if less than 12 in. (300 mm) high at their lowest point.

Exception No. 2: At the discretion of the authority having jurisdiction, water spray protection in accordance with NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection, or NFPA 13, Standard for the Installation of Sprinkler Systems, is permitted to be used.

22.5.2.5 Where a tank is located in an area subject to flooding, provisions shall be taken to prevent tanks, either full or empty, from floating during a rise in water level up to the established maximum flood stage. *(See 21.7.3.)*

22.6 Vent Piping for Aboveground Tanks.

Piping for normal and emergency relief venting shall be constructed in accordance with Chapter 27.

22.7 Emergency Relief Venting for Fire Exposure for Aboveground Storage Tanks.

22.7.1 General.

22.7.1.1 Every aboveground storage tank shall have emergency relief venting in the form of construction or a device or devices that will relieve excessive internal pressure caused by an exposure fire.

22.7.1.1.1 This requirement shall apply to each compartment of a compartmented tank, the interstitial space (annulus) of a secondary containment–type tank, and the enclosed space of tanks of closed-top dike construction.

22.7.1.1.2 This requirement shall also apply to spaces or enclosed volumes, such as those intended for insulation, membranes, or weather shields, that are capable of containing liquid because of a leak from the primary vessel. The insulation, membrane, or weather shield shall not interfere with emergency venting.

22.7.1.1.3 Tanks storing Class IIIB liquids that are larger than 12,000 gal (45,400 L) capacity and are not within the diked area or the drainage path of tanks storing Class I or Class II liquids shall not be required to meet the requirements of 22.7.1.1.

22.7.1.2 For vertical tanks, the emergency relief venting construction referred to in 22.7.1.1 shall be permitted to be a floating roof, a lifter roof, a weak roof-to-shell seam, or another approved pressure-relieving construction.

22.7.1.3 If unstable liquids are stored, the effects of heat or gas resulting from polymerization, decomposition, condensation, or self-reactivity shall be taken into account.

22.7.1.4 If two-phase flow is anticipated during emergency venting, an engineering evaluation shall be conducted in order to size the pressure-relieving devices.

22.7.2 Weak Roof-to-Shell Seam Construction. If used, a weak roof-to-shell seam shall be constructed to fail preferential to any other seam and shall be designed in accordance with API Standard 650, *Welded Steel Tanks for Oil Storage*, or ANSI/UL 142, *Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids*.

22.7.3 Pressure-Relieving Devices.

22.7.3.1* Where entire dependence for emergency relief venting is placed upon pressure-relieving devices, the total venting capacity of both normal and emergency vents shall be sufficient to prevent rupture of the shell or bottom of a vertical tank or of the shell or heads of a horizontal tank.

22.7.3.2 Except as provided for in 22.7.3.5, 22.7.3.6, and 22.7.3.7, the total emergency relief venting capacity of both normal and emergency venting devices shall be not less than that determined in Table 22.7.3.2. *(See Annex B for the square footage of typical tank sizes.)*

Table 22.7.3.2 Required Emergency Relief Venting — Cubic Feet of Free Air per Hour (CFH) versus Wetted Area of Tank Shell (ft^2)

ft^2	CFH	ft^2	CFH	ft^2	CFH
20	21,100	160	168,000	900	493,000
30	31,600	180	190,000	1000	524,000
40	42,100	200	211,000	1200	557,000
50	52,700	250	239,000	1400	587,000
60	63,200	300	265,000	1600	614,000
70	73,700	350	288,000	1800	639,000
80	84,200	400	312,000	2000	662,000
90	94,800	500	354,000	2400	704,000
100	105,000	600	392,000	2800	742,000
120	126,000	700	428,000	and over	
140	147,000	800	462,000		

For SI units, 10 ft^2 = 0.93 m^2; 36 ft^3 = 1.0 m^3.

Notes:

(1) Interpolate for intermediate values not specified in the table.

(2) CFH is flow capacity at absolute pressure of 14.7 psi (101 kPa) and 60°F (15.6°C). See 22.7.3.10.2.

22.7.3.2.1 Emergency relief vent devices shall be vaportight and shall be permitted to be any one of the following:

(1) Self-closing manway cover

(2) Manway cover provided with long bolts that permit the cover to lift under internal pressure

(3) Additional or larger relief valve or valves

22.7.3.2.2 The wetted area of the tank shall be calculated as follows:

(1) Fifty-five percent of the total exposed area of a sphere or spheroid

(2) Seventy-five percent of the total exposed area of a horizontal tank

(3) One hundred percent of the exposed shell and floor area of a rectangular tank, but excluding the top surface of the tank

(4) The first 30 ft (9 m) above grade of the exposed shell area of a vertical tank

22.7.3.3* The total emergency relief venting capacity for tanks and storage vessels designed to operate at pressures above a gauge pressure of 1.0 psi (6.9 kPa) shall be as follows:

(1) For tanks whose wetted area does not exceed 2800 ft^2 (260 m^2), not less than that determined in Table 22.7.3.2

(2) For tanks whose wetted area exceeds 2800 ft^2 (260 m^2), not less than that determined in Table 22.7.3.3 or not less than that calculated by the following formula:

$$CFH = 1107(A)^{0.82}$$

where:

CFH = venting capacity requirement (ft^3 of free air per hour)
A = wetted area (ft^2)

Table 22.7.3.3 Required Emergency Relief Venting for Tanks with Wetted Area over 2800 ft^2 (260 m^2) and Operating at Gauge Pressure over 1 psi (6.9 kPa) — Cubic Feet of Free Air per Hour (CFH) versus Wetted Area of Tank Shell (ft^2)

ft^2	CFH	ft^2	CFH
2,800	742,000	9,000	1,930,000
3,000	786,000	10,000	2,110,000
3,500	892,000	15,000	2,940,000
4,000	995,000	20,000	3,720,000
4,500	1,100,000	25,000	4,470,000
5,000	1,250,000	30,000	5,190,000
6,000	1,390,000	35,000	5,900,000
7,000	1,570,000	40,000	6,570,000
8,000	1,760,000		

For SI units, 10 ft^2 = 0.93 m^2; 36 ft^3 = 1.0 m^3.
Notes:
(1) Interpolate for intermediate values not specified in the table.
(2) CFH is flow capacity at absolute pressure of 14.7 psi (101 kPa) and 60°F (15.6°C). See 22.7.3.10.2.

22.7.3.4 The total emergency relief venting capacity for any specific stable liquid shall be permitted to be determined by the following formula:

$$CFH = V \frac{1137}{L\sqrt{M}}$$

where:

CFH = venting capacity requirement (ft^3 of free air per hour)
V = ft^3 of free air per hour (CFH) value from Table 22.7.3.2
L = latent heat of vaporization of specific liquid (Btu/lb)
M = molecular weight of specific liquids

22.7.3.5 Except as provided for in 22.7.3.6 and 22.7.3.7, for tanks containing stable liquids, the required emergency relief venting capacity determined by 22.7.3.2, 22.7.3.3, or 22.7.3.4 shall be permitted to be multiplied by one of the following reduction factors when protection is provided as indicated. Only one of the following factors shall be used for any one tank:

(1) A reduction factor of 0.5 shall be allowed for tanks with wetted area greater than 200 ft^2 (19 m^2) that are provided with drainage that meets the requirements of 22.11.1.

(2) A reduction factor of 0.3 shall be allowed for tanks that are protected with a water spray system that meets the requirements of NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, and that are provided with drainage that meets the requirements of 22.11.1.

(3) A reduction factor of 0.3 shall be allowed for tanks that are protected with an automatically actuated water spray system that meets the requirements of NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*.

(4) A reduction factor of 0.3 shall be allowed for tanks protected with insulation that meets the requirements of 22.7.3.8.

(5) A reduction factor of 0.15 shall be allowed for tanks that are protected with a water spray system that meets the requirements of NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, and that have insulation that meets the requirements of 22.7.3.8.

22.7.3.6* Where water-miscible liquids whose heats of combustion and rates of burning are equal to or less than those of ethyl alcohol (ethanol) are stored, processed, or handled and where there is no potential fire exposure from liquids other than these liquids, the emergency relief venting capacity shall be permitted to be reduced by an additional 50 percent. Drainage shall not be required to obtain this reduction. In no case shall the factors in 22.7.3.5(1) through 22.7.3.5(5) be reduced to less than 0.15.

22.7.3.7* Where liquids that are not water-miscible and whose heats of combustion and rates of burning are equal to or less than those of ethyl alcohol (ethanol) are stored, processed, or handled and where there is no potential fire exposure from liquids other than these liquids, the emergency relief venting capacity determined by 22.7.3.5(1) or 22.7.3.5(3) shall be permitted to be reduced by an additional 50 percent. No further reduction shall be allowed for protection by means of water spray. Drainage shall not be required to obtain this reduction. In no case shall the factors in 22.7.3.5(1) through 22.7.3.5(5) be reduced to less than 0.15.

22.7.3.8 Insulation for which credit is taken in 22.7.3.5(4) and 22.7.3.5(5) shall meet the following performance criteria:

(1) The insulation shall remain in place under fire exposure conditions.

(2) The insulation shall withstand dislodgment when subjected to hose stream impingement during fire exposure.

(3) The insulation shall maintain a maximum conductance value of 4.0 Btu/hr/ft^2/°F (2.3 W/m^2/°C) when the outer insulation jacket or cover is at a temperature of 1660°F (904°C) and when the mean temperature of the insulation is 1000°F (538°C).

Exception: The requirement of 22.7.3.8(2) need not apply where use of solid hose streams is not contemplated or would not be practical.

22.7.3.9 The outlets of all vents and vent drains on tanks equipped with emergency relief venting that permits pressures to exceed a gauge pressure of 2.5 psi (17.2 kPa) shall be arranged to discharge so that localized overheating of or flame impingement on any part of the tank will not occur if vapors from the vents are ignited.

22.7.3.10 Each commercial tank venting device shall have the following stamped on it:

(1) Start-to-open pressure

(2) Pressure at which the valve reaches the full open position

(3) Flow capacity at the pressure indicated by 22.7.3.10(2)

22.7.3.10.1 If the start-to-open pressure is less than a gauge pressure of 2.5 psi (17.2 kPa) and the pressure at the full open position is greater than a gauge pressure of 2.5 psi (17.2 kPa), the flow capacity at a gauge pressure of 2.5 psi (17.2 kPa) shall also be stamped on the venting device.

22.7.3.10.2 The flow capacity shall be expressed in cubic feet per hour of air at 60°F (15.6°C) and an absolute pressure of 14.7 psi (101 kPa).

22.7.3.10.3 The flow capacity of tank venting devices less than 8 in. (200 mm) in nominal pipe size shall be determined by actual test. These tests shall be permitted to be conducted by a qualified, impartial outside agency or by the manufacturer if certified by a qualified, impartial observer.

22.7.3.10.4* The flow capacity of tank venting devices equal to or greater than 8 in. (200 mm) nominal pipe size, including manway covers with long bolts, shall be determined by test or by calculation. If determined by calculation, the opening pressure shall be measured by test, the calculation shall be based on a flow coefficient of 0.5 applied to the rated orifice, the rating pressure and corresponding free orifice area shall be stated, and the word *calculated* shall appear on the nameplate.

22.7.4* Extension of Emergency Vent Piping. Piping to or from approved emergency vent devices for atmospheric and low-pressure tanks shall be sized to provide emergency vent flows that limit the back pressure to less than the maximum pressure permitted by the design of the tank. Piping to or from approved emergency vent devices for pressure vessels shall be sized in accordance with the ASME *Boiler and Pressure Vessel Code*.

22.8 Fire Protection for Aboveground Storage Tanks.

22.8.1* A fire-extinguishing system in accordance with an applicable NFPA standard shall be provided or shall be available for vertical atmospheric fixed-roof storage tanks larger than 50,000 gal (190 m^3) capacity, storing Class I liquids, if located in a congested area where there is an unusual exposure hazard to the tank from adjacent property or to adjacent property from the tank.

22.8.2 Fixed-roof tanks storing Class II or Class III liquids at temperatures below their flash points and floating-roof tanks storing any liquid shall not require protection when installed in accordance with this chapter.

22.9 Additional Requirements for Fire-Resistant Aboveground Storage Tanks.

22.9.1 Fire-resistant tanks shall be tested and listed in accordance with UL 2080, *Standard for Fire Resistant Tanks for Flammable and Combustible Liquids*.

22.9.2 Fire-resistant tanks shall also meet both of the following requirements:

(1) The construction that provides the required fire-resistive protection shall reduce the heat transferred to the primary tank in order to limit the temperature of the primary tank to an average maximum rise of 800°F (430°C) and a single point maximum rise of 1000°F (540°C) and to prevent release of liquid, failure of the primary tank, failure of the supporting structure, and impairment of venting for a period of not less than 2 hours when tested using the fire exposure specified in UL 2080.

(2) Reduction in sizing of the emergency vents in accordance with 22.7.3.5 shall not be permitted.

22.10 Additional Requirements for Protected Aboveground Storage Tanks.

22.10.1 Protected aboveground tanks shall be tested and listed in accordance with ANSI/UL 2085, *Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids*.

22.10.2 Protected aboveground tanks shall also meet both of the following requirements:

(1) The construction that provides the required fire-resistive protection shall reduce the heat transferred to the primary tank in order to limit the temperature of the primary tank to an average maximum rise of 260°F (144°C) and a single point maximum rise of 400°F (204°C) and to prevent release of liquid, failure of the primary tank, failure of the supporting structure, and impairment of venting for a period of not less than 2 hours when tested using the fire exposure specified in ANSI/UL 2085, *Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids*.

(2) Reduction in sizing of the emergency vents in accordance with 22.7.3.5 shall not be permitted.

22.11* Control of Spills from Aboveground Storage Tanks.

Every tank that contains a Class I, Class II, or Class IIIA liquid shall be provided with means to prevent an accidental release of liquid from endangering important facilities and adjoining property or from reaching waterways. Such means shall meet the requirements of 22.11.1, 22.11.2, 22.11.3, or 22.11.4, whichever is applicable.

22.11.1 Remote Impounding. Where control of spills is provided by drainage to a remote impounding area so that spilled liquid does not collect around tanks, the requirements of 22.11.1.1 through 22.11.1.4 shall apply.

22.11.1.1 The drainage route shall have a slope of not less than 1 percent away from the tank for at least 50 ft (15 m) toward the impounding area.

22.11.1.2 The impounding area shall have a capacity not less than that of the largest tank that drains into it.

Exception: Where compliance with 22.11.1.2 is not possible because there is not enough open area around the tanks, "partial" remote impounding for a percentage of the required capacity is permitted. The remainder of the volume required for spill control can be provided by open diking meeting the requirements of 22.11.2.

22.11.1.3 The drainage route shall be located so that, if the liquid in the drainage system is ignited, the fire will not seriously expose tanks or adjoining property.

22.11.1.4 The impounding area shall be located so that, when filled to capacity, the liquid will not be closer than 50 ft (15 m) from any property line that is or can be built upon or from any tank.

Exception: Where partial remote impounding as provided for in 22.11.1.2 is used, the liquid in the partial remote impounding area shall meet the requirements of 22.11.1.4. Tank spacing shall be determined based on the diked tank provisions of Table 22.4.2.1.

22.11.2 Impounding Around Tanks by Open Diking. Where control of spills is provided by means of impounding by open diking around the tanks, such systems shall meet the requirements of 22.11.2.1 through 22.11.2.8.

22.11.2.1 A slope of not less than 1 percent away from the tank shall be provided for at least 50 ft (15 m) or to the dike base, whichever is less.

22.11.2.2* The volumetric capacity of the diked area shall not be less than the greatest amount of liquid that can be released from the largest tank within the diked area, assuming a full tank.

22.11.2.2.1 To allow for volume occupied by tanks, the capacity of the diked area enclosing more than one tank shall be calculated after deducting the volume of the tanks, other than the largest tank, below the height of the dike.

22.11.2.3 To permit access, the outside base of the dike at ground level shall be no closer than 10 ft (3 m) to any property line that is or can be built upon.

22.11.2.4 Walls of the diked area shall be of earth, steel, concrete, or solid masonry designed to be liquidtight and to withstand a full hydrostatic head.

22.11.2.4.1* Earthen walls 3 ft (0.9 m) or more in height shall have a flat section at the top not less than 2 ft (0.6 m) wide and shall have a slope that is consistent with the angle of repose of the material of which the wall is constructed.

22.11.2.5 Where the average interior height of the walls of the diked area exceeds 6 ft (1.8 m), provisions shall be made for normal access; necessary emergency access to tanks, valves, and other equipment; and egress from the diked enclosure. The following requirements shall apply:

(1) Where the average height of a dike containing Class I liquids is over 12 ft (3.6 m) high, measured from interior grade, or where the distance between any tank and the top inside edge of the dike wall is less than the height of the dike wall, provisions shall be made for operation of valves and for access to tank roof(s) without entering below the top of the dike. These provisions shall be permitted to be met through the use of remote-operated valves, elevated walkways, or other arrangements.

(2) Piping passing through dike walls shall be designed to withstand imposed stresses as a result of settlement or fire exposure.

(3) The distance between the shell of any tank and the toe of the interior of the dike wall shall be not less than 5 ft (1.5 m).

22.11.2.6 Each diked area containing two or more tanks shall be subdivided, preferably by drainage channels or at least by intermediate dikes, in order to prevent minor spills from a tank from endangering adjacent tanks within the diked area.

22.11.2.6.1 The drainage channels or intermediate dikes shall be located between tanks so as to take full advantage of the space with due regard for the individual tank capacities.

22.11.2.6.2 Intermediate dikes shall be not less than 18 in. (450 mm) in height.

22.11.2.6.3 Subdivision shall be provided according to the requirements of 22.11.2.6.3.1, 22.11.2.6.3.2, 22.11.2.6.3.3, 22.11.2.6.3.4, or 22.11.2.6.3.5, whichever is applicable.

22.11.2.6.3.1 Where stable liquids are stored in vertical cone roof tanks of weak roof-to-shell seam design or in floating roof tanks, one subdivision shall be provided for each tank greater than 10,000 bbl (420,000 gal or 1590 m^3) capacity. In addition, one subdivision shall be provided for each group of tanks [with no individual tank exceeding 10,000 bbl (420,000 gal or 1590 m^3) capacity] having an aggregate capacity not greater than 15,000 bbl (630,000 gal or 2385 m^3).

22.11.2.6.3.2 Where crude petroleum is stored in producing areas in any type of tank, one subdivision shall be provided for each tank greater than 10,000 bbl (420,000 gal or 1590 m^3) capacity. In addition, one subdivision shall be provided for each group of tanks [with no individual tank exceeding 10,000 bbl (420,000 gal or 1590 m^3) capacity] having an aggregate capacity not greater than 15,000 bbl (630,000 gal or 2385 m^3).

22.11.2.6.3.3 Where stable liquids are stored in tanks not covered in 22.11.2.6.3.1, one subdivision shall be provided for each tank greater than 2380 bbl (100,000 gal or 380 m^3) capacity. In addition, one subdivision shall be provided for each group of tanks [with no individual tank exceeding 2380 bbl (100,000 gal or 380 m^3) capacity] having an aggregate capacity not greater than 3750 bbl (150,000 gal or 570 m^3).

22.11.2.6.3.4* Where unstable liquids are stored in any type of tank, one subdivision shall be provided for each tank.

Exception: Tanks that store unstable liquids and that are installed with drainage meeting the requirements of NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection, need not meet this requirement.

22.11.2.6.3.5 Whenever two or more tanks storing Class I liquids, any one of which is over 150 ft (45 m) in diameter, are located in a common diked area, intermediate dikes shall be provided between adjacent tanks to hold at least 10 percent of the capacity of the tank so enclosed, not including the volume displaced by the tank.

22.11.2.7 Where provision is made for draining water from diked areas, such drains shall be controlled to prevent liquids from entering natural water courses, public sewers, or public drains.

22.11.2.7.1 Control of drainage shall be accessible under fire conditions from outside the dike.

22.11.2.8 Storage of combustible materials, empty drums, full drums, or barrels shall not be permitted within the diked area.

22.11.3 Impounding Around Tanks by Closed-Top Diking. Where control of spills is provided by means of impounding by closed-top diking around the tanks, such systems shall meet all of the requirements of 22.11.4 or shall meet the requirements of 22.11.3.1 through 22.11.3.4.

22.11.3.1* The volumetric capacity of the diked area shall not be less than the greatest amount of liquid that can be released from the largest tank within the diked area, assuming a full tank.

22.11.3.2 To allow for volume occupied by tanks, the capacity of the diked area enclosing more than one tank shall be calculated after deducting the volume of the tanks, other than the largest tank, below the height of the dike.

22.11.3.3 To permit access, the outside base of the dike at ground level shall be no closer than 10 ft (3 m) to any property line that is or can be built upon.

22.11.3.4 Walls of the diked area shall be of steel, concrete, or solid masonry designed to be liquidtight and to withstand a full hydrostatic head.

22.11.3.5 Where provision is made for draining water from diked areas, such drains shall be controlled to prevent liquids from entering natural water courses, public sewers, or public drains.

22.11.3.5.1 Control of drainage shall be accessible under fire conditions from outside the dike.

22.11.3.6 Storage of combustible materials, empty drums, full drums, or barrels shall not be permitted within the diked area.

22.11.3.7 The capacity of the primary tank shall not exceed the capacities given in Table 22.11.4.1.

22.11.3.8 All piping connections to the tank shall be made above the normal maximum liquid level.

22.11.3.9 The tank shall be capable of resisting the damage from the impact of a motor vehicle, or collision barriers shall be provided.

22.11.3.10 Where the means of secondary containment is enclosed, it shall be provided with emergency venting in accordance with Section 22.7.

22.11.3.11 Means shall be provided to establish the integrity of the secondary containment, in accordance with Chapter 21.

22.11.3.12 Where the normal vent or the emergency vent device or both discharge outside the enclosure created by the closed-top diking, the tank within the enclosure shall comply with 22.11.4.4 and 22.11.4.5.

22.11.3.13 Where the fill connection for the tank within the enclosure created by the closed-top diking is not located within the enclosure, the tank shall meet the requirements of 22.11.4.4 and 22.11.4.5.

22.11.4 Secondary Containment–Type Aboveground Storage Tanks. Where a secondary containment–type tank is used to provide spill control, the tank shall meet all of the requirements of 22.11.4.1 through 22.11.4.10.

22.11.4.1 The capacity of the listed primary tank shall not exceed the capacities given in Table 22.11.4.1.

Table 22.11.4.1 Maximum Capacities for Secondary Containment–Type Aboveground Storage Tanks

	Capacity

22.11.4.1 The capacity of the listed primary tank shall not exceed the capacities given in Table 22.11.4.1.

Table 22.11.4.1 Maximum Capacities for Secondary Containment–Type Aboveground Storage Tanks

	Capacity	
Liquid Classification	**gal**	**L**
I	12,000	45,400
II and IIIA	20,000	75,700

22.11.4.2 All piping connections to the tank shall be made above the maximum liquid level.

22.11.4.3 Means shall be provided to prevent the release of liquid from the tank by siphon flow.

22.11.4.4 Means shall be provided for determining the level of liquid in the tank. This means shall be accessible to the delivery operator.

22.11.4.5 Means shall be provided to prevent overfilling by sounding an alarm when the liquid level in the tank reaches 90 percent of capacity and by automatically stopping delivery of liquid to the tank when the liquid level in the tank reaches 95 percent of capacity.

22.11.4.5.1 In no case shall these provisions restrict or interfere with the functioning of the normal vent or the emergency vent.

22.11.4.6 Spacing between adjacent tanks shall be not less than 3 ft (0.9 m).

22.11.4.7 The tank shall be capable of resisting the damage from the impact of a motor vehicle, or collision barriers shall be provided.

22.11.4.8 Where the means of secondary containment is enclosed, it shall be provided with emergency venting in accordance with Section 22.7.

22.11.4.9 Means shall be provided to establish the integrity of the secondary containment, in accordance with Chapter 21.

22.11.4.10 The secondary containment shall be designed to withstand the hydrostatic head resulting from a leak from the primary tank of the maximum amount of liquid that can be stored in the primary tank.

22.12 Equipment, Piping, and Fire Protection Systems in Remote Impoundment Areas and Diked Areas.

22.12.1* Location of Piping. Only piping for product, utility, or fire protection purposes directly connected to a tank or tanks within a single diked area shall be routed through a diked area, a remote impoundment area, a spillway draining to a remote impoundment area, or above a storage tank drainage area where the piping can be exposed to a fire.

Exception: Piping for other product lines and from adjacent tanks is permitted to be routed through such areas if engineering designs are provided to incorporate features to prevent the piping from creating an exposure hazard.

22.12.2 Drainage.

22.12.2.1 Drainage shall be provided to prevent accumulation of any liquid under the piping by providing a slope of not less than 1 percent away from the piping for at least 50 ft (15 m).

22.12.2.2 Corrosion-resistant piping and piping that is protected against corrosion shall be permitted to be buried where such drainage is not provided.

22.12.3* **Location of Equipment.** If located in a remote impoundment area, a diked area, or a spillway draining to a remote impoundment area, process equipment, pumps, instrumentation, and electrical utilization equipment shall be located or protected so that a fire involving such equipment does not constitute an exposure hazard to the tank or tanks in the same area for a period of time consistent with emergency response capabilities.

22.12.4 Fire Protection Systems. Hose connections, controls, and control valves for application of fire protection foam or water to tanks shall be located outside remote impoundment areas, diked areas, or spillways draining to a remote impoundment area.

22.12.5 Combustible Materials. Structures such as stairways, walkways, instrumentation shelters, and supports for piping and equipment that are located in a remote impoundment area, diked area, or spillway draining to a remote impoundment area shall be constructed of noncombustible materials.

22.13 Tank Openings Other Than Vents.

22.13.1 Each connection to an aboveground tank through which liquid can normally flow shall be provided with an internal or an external valve located as close as practical to the shell of the tank.

22.13.2 Each connection below the liquid level through which liquid does not normally flow shall be provided with a liquidtight closure such as a valve, plug, or blind, or a combination of these.

22.13.3 Openings for gauging on tanks storing Class I liquids shall be provided with a vaportight cap or cover.

22.13.4 Filling and emptying connections for Class I, Class II, and Class IIIA liquids that are connected and disconnected shall be located outside of buildings at a location free from any source of ignition.

22.13.4.1 Such connections shall be located not less than 5 ft (1.5 m) away from any building opening.

22.13.4.2 Such connections for any liquid shall be closed and liquidtight when not in use and shall be properly identified.

22.14 Aboveground Storage Tanks Located in Areas Subject to Flooding.

22.14.1 Vertical tanks shall be located so that the tops of the tanks extend above the maximum flood stage by at least 30 percent of their allowable storage capacity.

22.14.2 Horizontal tanks that are located where more than 70 percent of the tank's storage capacity will be submerged at the established flood stage shall be secured by one of the following methods:

(1) Anchored to resist movement

(2) Attached to a foundation of steel and concrete or of concrete having sufficient weight to provide load for the

tank when filled with liquid and submerged by flood water to the established flood stage

(3) Secured from floating by other means

22.14.3 Tank vents or other openings that are not liquidtight shall extend above the maximum flood stage water level.

22.14.4 A dependable water supply shall be used for filling an empty or partially filled tank.

Exception: Where filling the tank with water is impractical or hazardous because of the contents of the tank, the tank should be protected by other means against movement or collapse.

22.14.5 Spherical or spheroid tanks shall be protected by any of the methods specified in Section 22.14.

22.15 Collision Protection for Aboveground Storage Tanks.

Where a tank is exposed to vehicular impact, protection shall be provided to prevent damage to the tank.

22.16 Installation Instructions for Aboveground Storage Tanks.

Factory-built aboveground tanks shall be provided with instructions for testing the tanks and for installation of the normal and emergency vents.

22.17 Inspection and Maintenance of Aboveground Storage Tanks.

22.17.1 Inspection and maintenance of aboveground tanks shall meet the requirements of Section 21.8.

22.17.2 Each aboveground steel tank shall be inspected and maintained in accordance with API 653, *Tank Inspection, Repair, Alteration, and Reconstruction*, or STI SP001, *Standard for Inspection of Aboveground Storage Tanks*, whichever is applicable.

22.17.3 Each tank constructed of other materials shall be inspected and maintained in accordance with manufacturers' instructions and applicable standards.

22.17.4 Pontoons in external floating roof tanks shall be inspected, at intervals not exceeding 5 years, by visual and atmospheric testing methods to ensure that the pontoon covers are mechanically secured to the floating roof deck and to ensure the pontoons do not contain liquids or vapors resulting from leaks or corrosion holes in the pontoons. Rim vents, if any, shall also be inspected to ensure that they are not frozen open.

Chapter 23 Storage of Liquids in Tanks — Underground Tanks

23.1 Scope.

This chapter shall apply to the following:

(1) The storage of flammable and combustible liquids, as defined in 3.3.30 and Chapter 4, in fixed underground tanks

(2) The installation and operation of underground tanks

23.2 Definitions Specific to Chapter 23. (Reserved)

23.3 General Requirements.

23.3.1 Installation. All underground tanks shall be installed in accordance with the manufacturer's instructions.

23.3.2 Excavation. Excavation for underground tanks shall not undermine foundations of existing structures.

23.3.3* Care in Handling of Tank. The tank shall not be damaged during delivery, unloading, and placement into the tank excavation.

23.3.4* External Corrosion Protection for Underground Storage Tank. Underground tanks and their piping shall be protected by either of the following:

(1) A properly engineered, installed, and maintained cathodic protection system in accordance with recognized engineering standards of design

(2) Approved or listed corrosion-resistant materials or systems

23.3.4.1* Selection of the type of protection to be employed shall be based upon the corrosion history of the area and the judgment of a qualified engineer.

23.3.4.2* The authority having jurisdiction shall be permitted to waive the requirements for corrosion protection where an engineering evaluation demonstrates that such protection is not necessary.

23.4 Location of Underground Storage Tanks.

23.4.1 Underground tanks or tanks under buildings shall be located with respect to existing building foundations and supports so that the loads carried by the foundation are not transmitted to the tank.

23.4.2 The distance from any part of a tank storing Class I liquids to the nearest wall of any basement or pit shall be not less than 1 ft (0.3 m) and to any property line that can be built upon, not less than 3 ft (0.9 m).

23.4.3 The distance from any part of a tank storing Class II or Class III liquids to the nearest wall of any basement, pit, or property line shall be not less than 1 ft (0.3 m).

23.5 Installation of Underground Storage Tanks.

23.5.1 Bedding and Backfill.

23.5.1.1 Bedding and backfill shall be noncorrosive inert material of a type recommended by the tank manufacturer, such as compacted clean sand or compacted gravel.

23.5.1.2 Underground tanks shall be set on firm foundations and shall be set on the minimum depth of bedding recommended by the tank manufacturer. The bedding shall extend at least 12 in. (300 mm) in all directions beyond the perimeter of the tank.

23.5.1.3 Underground tanks shall be surrounded with backfill to a depth of at least 12 in. (300 mm) or greater where specified by the tank manufacturer. The backfill shall be spread evenly in 12 in. (300 mm) to 18 in. (450 mm) vertical lifts (layers) and shall be compacted as recommended by the manufacturer.

23.5.2 Cover for Underground Storage Tanks.

23.5.2.1 Underground tanks shall be covered with one of the following:

(1) At least 12 in. (300 mm) of backfill, covered with 12 in. (300 mm) of clean earth

(2) At least 12 in. (300 mm) of compacted backfill, on top of which a slab of reinforced concrete at least 4 in. (100 mm) thick is placed

23.5.2.2 Where the tanks are, or are likely to be, subjected to traffic, they shall be protected against damage from vehicles passing over them by one of the following:

(1) At least 36 in. (900 mm) of backfill

(2) At least 18 in. (450 mm) of compacted backfill of a type recommended by the tank manufacturer and at least 6 in. (150 mm) of reinforced concrete

(3) At least 18 in. (450 mm) of compacted backfill of a type recommended by the tank manufacturer and at least 8 in. (200 mm) of asphaltic concrete

23.5.2.3 When asphaltic or reinforced concrete paving is used as part of the protection, it shall extend at least 12 in. (300 mm) horizontally beyond the outline of the tank in all directions.

23.5.3 Maximum Burial Depth and Cover.

23.5.3.1* Maximum burial depth shall be specified by the tank manufacturer and shall be marked on the tank.

23.5.3.2 When the depth of cover is greater than the diameter of the tank or if the pressure at the bottom of the tank can exceed a gauge pressure of 10 psi (69 kPa), the manufacturer of the tank shall be consulted to determine if reinforcement of the tank is required. The specific gravity of the liquid to be stored shall be a design factor.

23.6 Normal Venting for Underground Storage Tanks.

23.6.1* Tank venting systems shall be provided with sufficient capacity to prevent blowback of vapor or liquid at the fill opening while the tank is being filled.

23.6.2 Vent piping shall be sized in accordance with Table 23.6.2, but shall not be less than 1.25 in. (32 mm) nominal inside diameter.

Table 23.6.2 Nominal Vent Line Diameter in Inches

Maximum Flow (gpm)	Pipe Length*		
	50 ft	100 ft	200 ft
100	1.25	1.25	1.25
200	1.25	1.25	1.25
300	1.25	1.25	1.5
400	1.25	1.5	2
500	1.5	1.5	2
600	1.5	2	2

Table 23.6.2 Nominal Vent Line Diameter in Inches

Maximum Flow (gpm)	Pipe Length*		
	50 ft	100 ft	200 ft
700	2	2	2
800	2	2	3
900	2	2	3
1000	2	2	3

For SI units, 1 in. = 25 mm; 1 ft = 0.3 m; 1 gal = 3.8 L.

*Assumes stated length of piping, plus 7 ells.

23.6.3 Where tank venting devices are installed in vent lines, their flow capacities shall be determined in accordance with 22.7.3.10.

23.6.4 Piping for normal venting shall be designed in accordance with Chapter 27.

23.7 Reserved.

23.8 Reserved.

23.9 Reserved.

23.10 Reserved.

23.11 Control of Spills from Underground Storage Tanks. (Reserved)

23.12 Reserved.

23.13 Tank Openings Other than Vents.

23.13.1 Connections for all tank openings shall be liquidtight and vaportight.

23.13.2 Openings for manual gauging, if independent of the fill pipe, shall be provided with a liquidtight and vaportight cap or cover. Covers shall be kept closed when not gauging.

23.13.2.1 If inside a building, each such opening shall be protected against liquid overflow and possible vapor release by means of a spring-loaded check valve or other approved device.

23.13.3 Fill and discharge lines shall enter tanks only through the top.

23.13.4 Fill lines shall be sloped toward the tank.

23.13.5 Underground tanks for Class I liquids having a capacity of more than 1000 gal (3800 L) shall be equipped with a tight fill device for connecting the fill hose to the tank.

23.13.6 Filling, emptying, and vapor recovery connections for Class I, Class II, or Class IIIA liquids that are connected and disconnected shall be located outside of buildings at a location free from any source of ignition and not less than 5 ft (1.5 m) from any building opening.

23.13.6.1 Such connections shall be closed and liquidtight and vaportight when not in use.

23.13.6.2 Such connections shall be identified.

23.13.7 Tank openings provided for purposes of vapor recovery shall be protected against possible vapor release by means of a spring-loaded check valve or dry-break connection, or other approved device, unless the opening is pipe-connected to a vapor processing system.

23.13.7.1 Openings designed for combined fill and vapor recovery shall also be protected against vapor release unless connection of the liquid delivery line to the fill pipe simultaneously connects the vapor recovery line.

23.13.7.2 All connections shall be vaportight.

23.14 Underground Storage Tanks Located in Areas Subject to Flooding.

23.14.1 Water Ballast. At locations where an ample and dependable water supply is available, underground tanks containing flammable or combustible liquids, placed so that more than 70 percent of their storage capacity will be submerged at the maximum flood stage, shall be so anchored, weighted, or secured as to prevent movement when filled or loaded with water and submerged by floodwater to the established flood stage.

23.14.1.1 Tank vents or other openings that are not liquidtight shall be extended above maximum flood stage water level.

23.14.2* Tank Anchoring. At locations where an ample and dependable water supply is not available or where filling of underground tanks with water is impractical because of the contents, each tank shall be safeguarded against movement when empty and submerged by high groundwater or floodwater by anchoring or by securing by other means.

23.14.2.1 Each such tank shall be so constructed and installed that it will safely resist external pressures if submerged.

23.15 Reserved.

23.16 Installation Instructions for Underground Storage Tanks.

Factory-built underground tanks shall be provided with instructions for testing and for installation of the normal vents.

23.17 Inspection and Maintenance of Underground Storage Tanks.

23.17.1 Inspection and maintenance for underground tanks shall meet the requirements of Section 21.8.

23.17.2 Overfill protection devices or systems shall be inspected and tested annually to ensure proper operation.

Chapter 24 Storage Tank Buildings

24.1* Scope.

24.1.1 This chapter shall apply to installations of tanks storing Class I, Class II, and Class IIIA liquids in storage tank buildings.

24.1.2 This chapter shall also apply to installations of aboveground storage tanks storing Class IIIB liquids in storage tank buildings where Class IIIB liquids are heated up to or above their flash point.

24.1.3 This chapter shall not apply to the following:

(1) Tanks covered by Chapters 17, 18, and 19.

(2) A tank that has a canopy or roof that does not limit the dissipation of heat or dispersion of flammable vapors and does not restrict fire-fighting access and control. Such tanks shall comply with the provisions of Chapter 22.

24.2 Definitions Specific to Chapter 24. (Reserved)

24.3 General Requirements. (Reserved)

24.3.1 Reserved.

24.4 Location of Storage Tank Buildings.

24.4.1 Tanks and associated equipment within the storage tank building shall be so located that a fire in the area shall not constitute an exposure hazard to adjoining buildings or tanks for a period of time consistent with the response and suppression capabilities of the fire-fighting operations available to the location. Compliance with 24.4.2 through 24.4.8 shall be deemed as meeting the requirements of 24.4.1.

24.4.2 The minimum distance from exposed property lines and buildings for tank installations within structures having walls with a fire resistance rating of less than 2 hours shall be in accordance with Table 24.4.2.

Table 24.4.2 Location of Storage Tank Buildings with Respect to Property Lines, Public Ways, and the Nearest Important Building on the Same Property

	Minimum Distance from Property Line that Is or Can Be Built Upon, Including Opposite Side of Public Way (ft)				Minimum Distance from Nearest Side of Any Public Way or from Nearest Important Building on Same Property (ft)			
	Stable Liquid Emergency Relief		Unstable Liquid Emergency Relief		Stable Liquid Emergency Relief		Unstable Liquid Emergency Relief	
Largest Tank — Operating Liquid Capacity (gal)	Not over 2.5 psi	Over 2.5 psi	Not over 2.5 psi	Over 2.5 psi	Not over 2.5 psi	Over 2.5 psi	Not over 2.5 psi	Over 2.5 psi
Up to 12,000	15	25	40	60	5	10	15	20
12,001 to 30,000	20	30	50	80	5	10	15	20
30,001 to 50,000	30	45	75	120	10	15	25	40
50,001 to 100,000	50	75	125	200	15	25	40	60

Table 24.4.2 Location of Storage Tank Buildings with Respect to Property Lines, Public Ways, and the Nearest Important Building on the Same Property

	Minimum Distance from Property Line that Is or Can Be Built Upon, Including Opposite Side of Public Way (ft)				Minimum Distance from Nearest Side of Any Public Way or from Nearest Important Building on Same Property (ft)			
	Stable Liquid Emergency Relief		Unstable Liquid Emergency Relief		Stable Liquid Emergency Relief		Unstable Liquid Emergency Relief	
Largest Tank — Operating Liquid Capacity (gal)	Not over 2.5 psi	Over 2.5 psi	Not over 2.5 psi	Over 2.5 psi	Not over 2.5 psi	Over 2.5 psi	Not over 2.5 psi	Over 2.5 psi

For SI units, 1 gal = 3.8 L; 1 ft = 0.3 m; 1 psi = 6.9 kPa.

24.4.3 The capacity of any individual tank shall not exceed 100,000 gal (380 m^3) without the approval of the authority having jurisdiction.

24.4.4 Where protection for exposures is not provided, the distances given in Table 24.4.2 shall be doubled. The distances shall not be required to exceed 300 ft (90 m).

24.4.5 Where a storage tank building has an exterior wall facing an exposure, the distances in Table 24.4.2 shall be permitted to be modified as follows:

(1) Where the wall is a blank wall having a fire resistance rating of not less than 2 hours, separation distance between the storage tank building and its exposure shall not be required to be greater than 25 ft (7.6 m).

(2) Where a blank wall having a fire resistance rating of not less than 4 hours is provided, the distance requirements of Table 24.4.2 shall not apply.

(3)* Where Class IA liquids or unstable liquids are stored, the exposing wall shall have explosion resistance in accordance with recognized engineering standards, and deflagration venting designed in accordance with NFPA 68, *Standard on Explosion Protection by Deflagration Venting*, shall be provided in the nonexposing walls and roof.

24.4.6 Other equipment associated with tanks, such as pumps, heaters, filters, and exchangers, shall not be located closer than 25 ft (7.6 m) to property lines where the adjoining property is or can be built upon or to the nearest important building on the same property that is not an integral part of the storage tank building. This spacing requirement shall not apply where exposures are protected as outlined in 24.4.2.

24.4.7 Tanks in which unstable liquids are stored shall be separated from potential fire exposures by a clear space of at least 25 ft (7.6 m) or by a wall having a fire resistance rating of not less than 2 hours.

24.4.8 Each storage tank building and each tank within the building shall be accessible from at least two sides for fire fighting and fire control.

24.4.9 Class I liquids and Class II or Class IIIA liquids heated above their flash points shall not be stored in basements.

24.5 Construction of Storage Tank Buildings.

24.5.1 Storage tank buildings shall be constructed so as to maintain structural integrity for 2 hours under fire exposure conditions and to provide access and egress for unobstructed movement of all personnel and fire protection equipment. Compliance with 24.5.2 through 24.5.7 shall be deemed as meeting the requirements of 24.5.1.

24.5.2* Buildings or structures shall be of at least 2-hour fire resistance rating.

24.5.2.1 Noncombustible or combustible construction shall be permitted when protected by automatic sprinklers or equivalent protection subject to the approval of the authority having jurisdiction.

24.5.3 Where Class I liquids are stored above grade within buildings with basements or other belowgrade areas into which flammable vapors can travel, such belowgrade areas shall be provided with mechanical ventilation designed to prevent the accumulation of flammable vapors. Enclosed storage tank pits shall not be considered basements.

24.5.4* Storage tank buildings where Class IA liquids are stored shall be designed to direct flame, combustion gases, and pressure resulting from an deflagration away from important buildings or occupied areas through the use of damage-limiting construction. The damage-limiting construction design shall be designed in accordance with NFPA 68, *Standard on Explosion Protection by Deflagration Venting*, and shall be acceptable to the authority having jurisdiction.

24.5.5 Storage tank buildings where unstable liquids are stored shall be designed using an approved engineered construction method that is intended to limit damage from an explosion (deflagration or detonation, depending on the liquid).

24.5.6* Access aisles of at least 3 ft (0.9 m) shall be maintained for movement of fire-fighting personnel and fire protection equipment.

24.5.7 A clear space of at least 3 ft (0.9 m) shall be maintained between the top of each tank and the building structure for buildings protected in accordance with 24.6.2.3. For buildings without fixed fire suppression systems, sufficient clear space shall be provided to allow for the application of hose streams to the top of the tank(s) for cooling purposes.

24.6 Fire Protection for Storage Tank Buildings.

24.6.1 Manual Fire Control Equipment for Storage Tank Buildings.

24.6.1.1* Listed portable fire extinguishers shall be provided for facilities in such quantities, sizes, and types as could be needed for special storage hazards as determined in accordance with 21.6.1.2.

24.6.1.2* Where the need is indicated in accordance with 21.6.3, water shall be utilized through standpipe and hose systems, or through hose connections from sprinkler systems using combination spray and straight stream nozzles to permit effective fire control.

24.6.1.3 Where the need is indicated in accordance with 21.6.3, mobile foam apparatus shall be provided.

24.6.2 Fixed Fire Control Equipment for Tank Buildings.

24.6.2.1 A reliable water supply or other suitable fire control agent shall be available in pressure and quantity to meet the fire demands indicated by special storage hazards or exposure as determined by 21.6.3.

24.6.2.2* Hydrants, with or without fixed monitor nozzles, shall be provided in accordance with accepted practice. The number and placement shall depend on the hazard of the storage, or exposure, as determined by 21.6.3.

24.6.2.3* Where the need is indicated by the hazards of storage or exposure as determined by 21.6.3, fixed protection shall be required utilizing approved foam, foam-water sprinkler systems, sprinkler systems, water spray systems, deluge systems, fire-resistive materials, or a combination of these.

24.6.2.3.1 When foam or foam-water fire protection systems are provided, discharge densities shall be determined based on the listing criteria for selected foam discharge devices, the foam concentrate, and the specific flammable or combustible liquids to be protected.

24.6.2.4 If provided, fire control systems shall be designed, installed, and maintained in accordance with the following NFPA standards:

(1) NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*

(2) NFPA 12, *Standard on Carbon Dioxide Extinguishing Systems*

(3) NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems*

(4) NFPA 13, *Standard for the Installation of Sprinkler Systems*

(5) NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*

(6) NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*

(7) NFPA 17, *Standard for Dry Chemical Extinguishing Systems*

(8) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*

24.7 Emergency Control Systems for Storage Tank Buildings. (Reserved)

24.8 Electrical Systems for Storage Tank Buildings.

24.8.1 Installation of electrical utilization equipment and wiring shall meet the requirements of Chapter 7.

24.8.2 Chapter 7 shall be used to determine the extent of classified locations for the purpose of installation of electrical equipment.

24.8.2.1 In establishing the extent of a classified location, it shall not extend beyond a floor, wall, roof, or other solid partition that has no openings within the classified area.

24.9 Containment, Drainage, and Spill Control from Storage Tank Buildings.

24.9.1 Drainage systems shall be designed to minimize fire exposure to other tanks and adjacent properties or waterways. Compliance with 24.9.2 through 24.9.6 shall be deemed as meeting the requirements of 24.9.1.

24.9.2 The facility shall be designed and operated to prevent the discharge of flammable or combustible liquids to public waterways, public sewers, or adjoining property under normal operating conditions.

24.9.3 Except for drains, solid floors shall be liquidtight and walls shall be liquidtight where they join the floor and for at least 4 in. (100 mm) above the floor.

24.9.4 Openings to adjacent rooms or buildings shall be provided with noncombustible, liquidtight raised sills or ramps at least 4 in. (100 mm) in height or shall be otherwise designed to prevent the flow of liquids to the adjoining areas.

24.9.4.1 An open-grated trench across the width of the opening inside of the room that drains to a safe location shall be permitted to be used as an alternative to a sill or ramp.

24.9.5 Means shall be provided to prevent liquid spills from running into basements.

24.9.6* The containment shall have a capacity not less than that of the largest tank that can drain into it.

24.9.7 Emergency drainage systems shall be provided to direct flammable or combustible liquid leakage and fire-protection water to a safe location.

24.9.8 Curbs, scuppers, or special drainage systems shall be permitted to be used.

24.9.9 Emergency drainage systems, if connected to public sewers or discharged into public waterways, shall be equipped with traps or separators.

24.10 Ventilation for Storage Tank Buildings.

24.10.1 Storage tank buildings storing Class I liquids or Class II or Class IIIA liquids at temperatures above their flash points shall be ventilated at a rate sufficient to maintain the concentration of vapors within the building at or below 25 percent of the lower flammable limit. Compliance with 24.10.2 through 24.10.7 shall be deemed as meeting the requirements of 24.10.1.

24.10.2* Ventilation shall be designed based on one of the following:

(1) Calculations based on the anticipated fugitive emissions *(See Annex F for calculation methods.)*

(2) Sampling of the actual vapor concentration under normal operating conditions

(3) Ventilation at a rate of not less than 1 cfm of exhaust air for each square foot of solid floor area (0.3 $m^3/min/m^2$)

24.10.2.1 If vapor concentrations are confirmed by sampling, the sampling shall be conducted at a distance of a 5 ft (1.5 m) radius from each potential vapor source extending to or toward the bottom and the top of the enclosed storage area. The vapor concentration used to determine the required ventilation rate shall be the highest measured concentration during the sampling procedure.

24.10.3 Ventilation shall be accomplished by natural or mechanical ventilation, with discharge or exhaust to a safe location outside the building.

24.10.3.1 Recirculation of exhaust air shall be permitted only when it is monitored continuously using a fail-safe system that is designed to automatically sound an alarm, stop recirculation, and provide full exhaust to the outside in the event that vapor–air mixtures having concentrations over 25 percent of the lower flammable limit are detected.

24.10.4* Provision shall be made for introduction of make-up air in such a manner as to avoid short-circuiting the ventilation.

24.10.5 Ventilation shall be arranged to include all floor areas or pits where flammable vapors can collect.

24.10.6 Where natural ventilation is inadequate, mechanical ventilation shall be provided and shall be kept in operation while flammable liquids are being handled.

24.10.6.1 Local or spot ventilation, if provided, shall be permitted to be used for up to 75 percent of the required ventilation.

24.10.7 Storage tank buildings with the interior grade more than 12 in. (300 mm) below the average exterior grade shall be provided with one of the following:

(1) Continuous mechanical ventilation in accordance with 24.10.2(3)

(2) A vapor detection system set to sound a warning alarm at a constantly attended location at 25 percent of the lower flammable limit, and to start the mechanical ventilation system

24.11 Reserved.

24.12 Explosion Control. (Reserved)

24.13 Vents for Tanks Inside Storage Tank Buildings.

24.13.1 Vents for tanks inside tank buildings shall be designed to ensure that vapors are not released inside the building. Compliance with 24.13.2 through 24.13.6 shall be deemed as meeting the requirements of 24.13.1.

24.13.2 Vents for tanks inside tank buildings shall be as required in 21.4.3 and Section 22.7.

24.13.3 Emergency venting by the use of a weak roof-to-shell seam shall not be permitted.

24.13.4 Automatic sprinkler systems designed in accordance with the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems*, shall be accepted by the authority having jurisdiction as equivalent to water spray systems for purposes of calculating the required airflow rates for emergency vents in 22.7.3.5, provided the density and coverage requirements of NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, are met.

24.13.5 Vents shall terminate outside the building.

24.13.6 Piping for normal and emergency relief venting shall meet the requirements of Chapter 27.

24.14 Tank Openings Other than Vents for Tanks Inside Storage Tank Buildings.

24.14.1 Tank openings other than vents for tanks inside tank buildings shall be designed to ensure that flammable liquids or vapors are not released inside the building. Compliance with 24.14.2 through 24.14.9 shall be deemed as meeting the requirements of 24.14.1.

24.14.2 All tank openings that are located at or below the maximum liquid level shall be liquidtight. Those that are located above the maximum liquid level shall be normally closed and shall be mechanically secured to prevent release of vapors.

24.14.3 Each liquid transfer connection on any tank storing Class I or Class II liquids inside buildings shall be provided with one of the following:

(1) A normally closed, remotely activated valve

(2) An automatic-closing, heat-activated valve

(3) Another approved device

24.14.4 Connections used for emergency disposal or to provide for quick cutoff of flow in the event of fire in the vicinity of the tank shall not be required to meet the requirement of 24.14.3.

24.14.5 Each connection through which liquid can gravity flow from a tank inside a building shall be provided with an internal or an external valve located as close as practical to the shell of the tank. This valve shall be considered to be in compliance with 24.14.3. If a separate valve is used, both valves shall be located adjacent to each other.

24.14.6* Openings for manual gauging of Class I or Class II liquids, if independent of the fill pipe, shall be provided with a vaportight cap or cover that shall be kept closed when not in use.

24.14.6.1 Each such opening for any liquid shall be protected against liquid overflow and possible vapor release by means of a spring-loaded check valve or other approved device.

24.14.7 The inlet of the fill pipe and the outlet of a vapor recovery line for which connections to tank vehicles and tank cars are made and broken shall be as follows:

(1) Located outside of buildings at a location free from any source of ignition

(2) Located not less than 5 ft (1.5 m) away from any building opening

(3) Closed tight and protected against tampering when not in use

(4) Identified

24.14.8* Tanks storing Class I, Class II, or Class IIIA liquids inside buildings shall be equipped with a device, or other means shall be provided, to prevent overflow into the building.

24.14.9 Tank openings provided for purposes of vapor recovery shall be protected against possible vapor release by means of a spring-loaded check valve or dry-break connection or other approved device, unless the opening is pipe-connected to a vapor processing system.

24.14.9.1 Openings designed for combined fill and vapor recovery shall also be protected against vapor release unless connection of the liquid delivery line to the fill pipe simultaneously connects the vapor recovery line.

24.14.9.2 All connections shall be vaportight.

24.15 Detection and Alarm Systems for Storage Tank Buildings.

24.15.1 An approved means shall be provided to promptly notify those within the plant and the available public or mutual aid fire department of any fire or other emergency.

24.15.2 Those areas, including buildings, where the potential exists for a flammable liquid spill shall be monitored as appropriate. Such methods shall include both of the following:

(1) Personnel observation or patrol

(2) Monitoring equipment that indicates a spill or leak has occurred in an unattended area

24.16 Inspection and Maintenance for Storage Tank Buildings.

24.16.1 Combustible waste material and residues in operating areas shall be kept to a minimum, stored in covered metal containers, and disposed of daily.

24.16.2 Storage of combustible materials and empty or full drums or barrels shall not be permitted within the storage tank building.

Chapter 25 Storage Tank Vaults

25.1 Scope.

This chapter shall apply to the design, construction, and installation of vaults for aboveground tanks.

25.2 Definitions Specific to Chapter 25. (Reserved)

25.3 General Requirements.

25.3.1* Storage Tank Selection and Arrangement.

25.3.1.1 Aboveground tanks shall be permitted to be installed in vaults that meet the requirements of this chapter.

25.3.1.2 Vaults shall be constructed and listed in accordance with ANSI/UL 2245, *Standard for Below-Grade Vaults for Flammable Liquid Storage Tanks*.

25.3.1.3 Except as modified by the provisions of this chapter, vaults shall meet all other applicable provisions of this code.

25.3.1.4 Tanks installed in storage tank vaults shall be listed for aboveground use.

25.3.1.5 Each tank shall be in its own vault and shall be completely enclosed by the vault.

25.3.1.6 Sufficient clearance between the tank and the vault shall be provided to allow for visual inspection and maintenance of the tank and its appurtenances.

25.3.1.7 Backfill shall not be permitted around the tank.

25.3.1.8 Dispensing devices shall be permitted to be installed on the tops of vaults. Dispensing devices used for motor fuels shall be installed in accordance with NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*.

25.3.1.9 At each entry point into the vault, a warning sign indicating the need for procedures for safe entry into confined spaces shall be posted. Each entry point shall be secured against unauthorized entry and vandalism.

25.3.2 Storage Tank Appurtenances.

25.3.2.1 An approved means of overfill protection shall be provided for the tanks in the vaults. The use of ball float valves shall be prohibited.

25.3.2.2 Fill connections for vaults installed inside buildings shall comply with 22.13.4.

25.3.3 Vault Arrangement.

25.3.3.1 Vaults shall be permitted to be either above or below grade.

25.4 Location of Storage Tank Vaults.

In lieu of the separation distance requirements given in Section 22.4, separation distances between the vault and any of the following shall be permitted to be reduced to 0 ft (0 m), as measured from the outer perimeter of the vault wall:

(1) Any property line that is or can be built upon

(2) The near and far sides of a public way

(3) The nearest important building on the same property

25.5* Construction and Installation of Storage Tank Vaults.

25.5.1 Construction Requirements. Vaults shall be designed and constructed in accordance with 25.5.1.1 through 25.5.1.4.

25.5.1.1 The top of an abovegrade vault that contains a tank storing Class I liquid or Class II liquid stored at a temperature above its flash point shall be constructed of noncombustible material and shall be designed to be weaker than the walls of the vault to ensure that the thrust of any explosion occurring inside the vault is directed upward before destructive internal pressure develops within the vault.

25.5.1.2 The top of an at-grade or belowgrade vault that contains a tank storing Class I liquid or Class II liquid stored at a temperature above its flash point shall be designed to relieve or contain the force of any explosion occurring inside the vault.

25.5.1.3 Adjacent vaults shall be permitted to share a common wall.

25.5.1.4 Where required, the vault shall be wind and earthquake resistant, in accordance with recognized engineering standards.

25.5.2 Installation Requirements. Storage tank vaults shall be installed in accordance with the requirements of 25.5.2.1 and 25.5.2.2.

25.5.2.1 Each vault and its tank shall be anchored to resist uplifting by groundwater or flooding, including when the tank is empty.

25.5.2.2 Vaults that are not resistant to damage from the impact of a motor vehicle shall be protected by collision barriers.

25.6 Fire Protection for Storage Tank Vaults.

Each vault shall be provided with means to admit a fire suppression agent.

25.7 Emergency Controls for Storage Tank Vaults. (Reserved)

25.8 Electrical Systems for Storage Tank Vaults.

25.8.1 Installation of electrical utilization equipment and wiring shall meet the requirements of Chapter 7.

25.8.2 Chapter 7 shall be used to determine the extent of classified locations for the purpose of installation of electrical equipment.

25.9 Containment, Drainage, and Spill Control for Storage Tank Vaults.

25.9.1 Means shall be provided to recover liquid from the vault.

25.9.2 If a pump is used to meet this requirement, the pump shall not be permanently installed in the vault.

25.9.3 Electric-powered portable pumps shall be approved for use in Class I, Division 1 locations, as defined in NFPA 70, *National Electrical Code*.

25.10 Ventilation Systems for Storage Tank Vaults.

25.10.1 Vaults that contain tanks storing Class I liquids shall be ventilated at a rate of not less than 1 cfm/ft^2 of floor area (0.3 m^3/min/m^2), but not less than 150 cfm (4 m^3/min).

25.10.2 Such ventilation shall operate continuously or shall be designed to operate upon activation of a vapor and liquid detection system.

25.10.3 Failure of the exhaust airflow shall automatically shut down the dispensing system.

25.10.4 The exhaust system shall be designed to provide air movement across all parts of the vault floor.

25.10.5 Supply and exhaust ducts shall extend to within 3 in. (75 mm), but not more than 12 in. (300 mm) of the floor.

25.10.6 The exhaust system shall be installed in accordance with the provisions of NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*.

25.11 Reserved.

25.12 Explosion Control. (Reserved)

25.13 Vents for Tanks Inside Storage Tank Vaults.

25.13.1 Vent pipes that are provided for normal tank venting shall terminate outside the vault and at least 12 ft (3.6 m) above ground level and shall meet the requirements of 27.8.1.

25.13.2 Emergency vents shall be vaportight and shall be permitted to discharge inside the vault. Long-bolt manhole covers shall not be permitted for this purpose.

25.14 Tank Openings Other than Vents for Tanks Inside Storage Tank Vaults. (Reserved)

25.15 Detection and Alarm Systems for Storage Tank Vaults.

25.15.1 Each vault shall be provided with an approved vapor and liquid detection system that is equipped with on-site audible and visual warning devices with battery backup.

25.15.2 The vapor detection system shall sound an alarm when the system detects vapors that reach or exceed 25 percent of the lower flammable limit of the liquid stored.

25.15.3 Vapor detectors shall be located no higher than 12 in. (300 mm) above the lowest point in the vault.

25.15.4 The liquid detection system shall sound an alarm upon detection of any liquid, including water.

25.15.5 Liquid detectors shall be located in accordance with the manufacturer's instructions.

25.15.6 Activation of either the vapor detection system or the liquid detection system shall cause a signal to be sounded at an approved, constantly attended location within the facility serving the tanks or at an approved location.

25.16 Inspection and Maintenance of Storage Tank Vaults and Equipment.

Vaults and their required equipment shall be maintained in accordance with the requirements of this chapter.

Chapter 26 Reserved

Chapter 27 Piping Systems

27.1 Scope.

27.1.1 This chapter shall apply to the design, installation, testing, operation, and maintenance of piping systems for flammable and combustible liquids or vapors. Such piping systems shall include but not be limited to pipe, tubing, flanges, bolting, gaskets, valves, fittings, flexible connectors, the pressure-containing parts of other components including but not limited to expansion joints and strainers, and devices that serve such purposes as mixing, separating, snubbing, distributing, metering, control of flow, or secondary containment.

27.1.2 This chapter shall not apply to any of the following:

(1) Tubing or casing on any oil or gas wells and any piping connected directly thereto

(2) Motor vehicles, aircraft, boats, or piping that are integral to a stationary engine assembly

(3) Piping within the scope of any applicable boiler and pressure vessel code

27.2 Definitions Specific to Chapter 27.

For the purpose of this chapter, the following terms shall be defined as shown.

27.2.1 Corrosion Protection. A means to lessen or prevent the deterioration of the piping system from exposure to its contents or its environment.

27.2.2 Flexible Connector. A connection joint in a piping system that allows differential movement of the piping system and limits system stress and mechanical damage.

27.2.3 Leak. An unintended release of liquid or vapor from the piping system due to failure of the piping system.

27.2.4 Secondary Containment. Containment that is external to and separate from the primary piping system.

27.3 General Requirements.

27.3.1 Performance Standards. The design, fabrication, assembly, test, and inspection of piping systems shall be suitable for the working pressures and structural stresses to be encountered by the piping system. Compliance with applicable sections of ASME B31, *Code for Pressure Piping*, and the provisions of this chapter shall be considered *prima facie* evidence of compliance with the foregoing provisions.

27.3.2 Tightness of Piping. Piping systems shall be maintained liquidtight. A piping system that has leaks that constitute a hazard shall be emptied of liquid or repaired in a manner acceptable to the authority having jurisdiction.

27.4 Materials of Construction for Piping Systems.

27.4.1 Materials Specifications. Pipe, valves, faucets, couplings, flexible connectors, fittings, and other pressure-containing parts shall meet the material specifications and pressure and temperature limitations of ASME B31, *Code for Pressure Piping*, except as provided for in 27.4.2, 27.4.3, and 27.4.4.

27.4.2 Ductile Iron. Ductile (nodular) iron shall meet the specifications of ASTM A 395, *Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures*.

27.4.3 Materials of Construction for Valves. Valves at storage tanks, as required by Sections 22.13 and 24.14, and their connections to the tank shall be of steel or ductile iron, except as provided for in 27.4.3.1, 27.4.3.2, or 27.4.4.

27.4.3.1 Valves at storage tanks shall be permitted to be other than steel or ductile iron where the chemical characteristics of the liquid stored are not compatible with steel or where the valves are installed internally to the tank.

27.4.3.2* Valves installed externally to the tank shall be permitted to be other than steel or ductile iron if the material of construction has a ductility and melting point comparable to steel or ductile iron and is capable of withstanding the stresses and temperatures involved in fire exposure or the valves are otherwise protected from fire exposures, such as by materials having a fire resistance rating of not less than 2 hours.

27.4.3.3 Cast iron, brass, copper, aluminum, malleable iron, and similar materials shall be permitted to be used on tanks described in 22.4.2.1.1 or on tanks storing Class IIIB liquids where the tanks are located outdoors and not within a diked area or drainage path of a tank storing a Class I, Class II, or Class IIIA liquid.

27.4.4 Low Melting Point Materials. Low melting point materials such as aluminum, copper, and brass; materials that soften on fire exposure such as plastics; or nonductile materials such as cast iron shall be permitted to be used underground within the pressure and temperature limitations of ASME B31, *Code for Pressure Piping*.

27.4.4.1 Such materials shall be permitted to be used outdoors above ground or inside buildings, provided they meet one of the following conditions:

(1) They are resistant to damage by fire.

(2) They are located so that any leakage resulting from failure will not expose persons, important buildings, or structures.

(3) They are located where leakage can be controlled by operation of one or more accessible, remotely located valves.

27.4.4.2 The piping materials chosen shall be compatible with the liquids being handled.

27.4.4.3 Piping systems of these materials shall be designed and built in accordance with recognized standards of design for the particular materials chosen or with approved equivalent standards or shall be listed.

27.4.5 Lining Materials. Piping, valves, and fittings shall be permitted to have combustible or noncombustible linings.

27.4.6 Nonmetallic Piping.

27.4.6.1 Piping systems of nonmetallic materials, including piping systems incorporating secondary containment, shall be designed and built in accordance with recognized standards of design or approved equivalents and shall be installed in accordance with 27.4.4.

27.4.6.2 Nonmetallic piping shall be built and used within the scope of their approvals or within the scope of UL 971, *Standard for Nonmetallic Underground Piping for Flammable Liquids*.

27.4.6.3 Nonmetallic piping systems and components shall be installed in accordance with manufacturer's instructions.

27.5 Pipe Joints.

27.5.1 Tightness of Pipe Joints.

27.5.1.1 Joints shall be made liquidtight and shall be welded, flanged, threaded, or mechanically attached.

27.5.1.2* Joints shall be designed and installed so that the mechanical strength of the joint will not be impaired if exposed to a fire.

27.5.1.3 Threaded joints shall be made with a suitable thread sealant or lubricant.

27.5.1.4 Joints in piping systems handling Class I liquids shall be welded when located in concealed spaces within buildings.

27.5.2 Flexible Connectors. Listed flexible connectors shall be permitted to be used where installed in accordance with 27.5.3.

27.5.3 Friction Joints.

27.5.3.1 Pipe joints dependent upon the friction characteristics of combustible materials for mechanical continuity or liquidtightness of piping shall only be used outside of buildings above ground, except as provided for in 27.5.3.3, or below ground.

27.5.3.2 Where such joints are used above ground, either the piping shall be secured to prevent disengagement at the fitting or the piping system shall be so designed that any spill resulting from disengagement will not expose persons, important buildings, or structures and can be controlled by remote valves.

27.5.3.3 Pipe joints dependent on the friction characteristics of their components shall be permitted to be used inside buildings provided both of the following are met:

(1) They are located where leakage can be controlled by operation of an accessible, remotely located valve that is outside the fire risk area.

(2) The mechanical strength and liquidtightness of the joint is not dependent on the resiliency of a combustible material or component.

27.6 Installation of Piping Systems.

27.6.1 General Requirements. Piping systems shall be supported and protected against physical damage, including damage from stresses arising from settlement, vibration, expansion, or contraction. The installation of nonmetallic piping shall be in accordance with the manufacturer's instructions.

27.6.2* Load-Bearing Supports. Load-bearing piping supports that are located in areas with a high fire exposure risk shall be protected by one or more of the following:

(1) Drainage to a safe location to prevent liquid from accumulating under pipeways

(2) Fire-resistive construction

(3) Fire-resistant protective coatings or systems

(4) Water spray systems designed and installed in accordance with NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*

(5) Other alternate means acceptable to the authority having jurisdiction

27.6.3 Pipe Penetrations. Piping that passes through or pierces a dike wall or the wall of a structure shall be designed to prevent damaging stresses and leakage due to settlement or fire exposure.

27.6.4* Corrosion Protection. Aboveground piping systems that are subject to external corrosion shall be suitably protected. Underground piping systems shall be protected against corrosion in accordance with Section 23.3.4.

27.6.5 Installation of Underground Piping.

27.6.5.1 Underground piping shall be installed on at least 6 in. (150 mm) of well-compacted bedding material.

27.6.5.2 In areas subject to vehicle traffic, the pipe trench shall be deep enough to permit a cover of at least 18 in. (450 mm) of well-compacted backfill material and pavement.

27.6.5.3 In paved areas where a minimum 2 in. (50 mm) of asphalt is used, backfill between the pipe and the asphalt shall be permitted to be reduced to 8 in. (200 mm) minimum.

27.6.5.4 In paved areas where a minimum 4 in. (100 mm) of reinforced concrete is used, backfill between the pipe and the asphalt shall be permitted to be reduced to 4 in. (100 mm) minimum.

27.6.5.5 In areas not subject to vehicle traffic, the pipe trench shall be deep enough to permit a cover of at least 6 in. (150 mm) of well-compacted backfill material.

27.6.5.6 A greater burial depth shall be provided when required by the manufacturer's instructions or where frost conditions are present.

27.6.5.7 Piping within the same trench shall be separated horizontally by at least two pipe diameters. Separation need not exceed 9 in. (230 mm).

27.6.5.8 Two or more levels of piping within the same trench shall be separated vertically by a minimum 6 in. (150 mm) of well-compacted bedding material.

27.6.6 Valves.

27.6.6.1 Piping systems shall contain valves to operate the system properly and to isolate the equipment in the event of an emergency.

27.6.6.2 Piping systems in connection with pumps shall contain valves to properly control the flow of liquid both in normal operation and in the event of an emergency.

27.6.6.3 Each connection to a piping system by which equipment such as tank cars, tank vehicles, or marine vessels discharges liquids into storage tanks shall be provided with a check valve for automatic protection against back flow if the piping arrangement is such that backflow from the system is possible. *(See also 22.13.1.)*

27.6.7 Common Loading and Unloading Piping. If loading and unloading is done through a common pipe system, a check valve shall not be required. However, an isolation valve shall be provided. This valve shall be located so that it is accessible or shall be remotely operable.

27.7 Testing of Piping Systems.

27.7.1 Initial Testing. Unless tested in accordance with the applicable sections of ASME B31, *Code for Pressure Piping*, all piping shall be tested before being covered, enclosed, or placed in use.

27.7.1.1 Testing shall be done hydrostatically to 150 percent of the maximum anticipated pressure of the system or pneumatically to 110 percent of the maximum anticipated pressure of the system, and the test pressure shall be maintained while a complete visual inspection of all joints and connections is conducted.

27.7.1.2 In no case shall the test pressure be less than a gauge pressure of 5 psi (35 kPa) measured at the highest point of the system, and in no case shall the test pressure be maintained for less than 10 minutes.

27.7.2 Initial Testing of Secondary Containment Piping. The interstitial (annular) space of secondary containment–type piping shall be tested hydrostatically or with air pressure at a gauge pressure of 5 psi (35 kPa) or shall be tested in accordance with its listing or with the manufacturer's instructions.

27.7.2.1 The pressure source shall be disconnected from the interstitial space to ensure that the test is being conducted on a closed system.

27.7.2.2 The pressure shall be maintained for a minimum of 1 hour.

27.7.3 Testing During Maintenance. Existing piping shall be tested in accordance with this subsection if the piping is leaking.

27.7.3.1 Piping that could contain a Class I, Class II, or Class IIIA liquid or vapor shall not be tested using air.

27.8 Vent Piping.

Vent piping shall be designed, constructed, and installed in accordance with this section.

27.8.1 Vent Piping for Aboveground Storage Tanks.

27.8.1.1 Where the outlets of vent pipes for tanks storing Class I liquids are adjacent to buildings or public ways, they shall be located so that vapors are released at a safe point outside of buildings and not less than 12 ft (3.6 m) above the adjacent ground level.

27.8.1.2 Vapors shall be discharged upward or horizontally away from adjacent walls.

27.8.1.3 Vent outlets shall be located so that vapors will not be trapped by eaves or other obstructions and shall be at least 5 ft (1.5 m) from building openings.

27.8.1.4 Manifolding of vent piping shall be prohibited except where required for special purposes such as vapor recovery, vapor conservation, or air pollution control.

27.8.1.4.1 Where vent piping is manifolded, pipe sizes shall be capable of discharging, within the pressure limitations of the system, the vapors they are required to handle when all manifolded tanks are subject to the same fire exposure.

27.8.1.5 Vent piping for tanks storing Class I liquids shall not be manifolded with vent piping for tanks storing Class II or Class III liquids unless positive means are provided to prevent the following:

(1) Vapors of Class I liquids from entering tanks storing Class II or Class III liquids

(2) Contamination

(3) Possible change in classification of the less volatile liquid

27.8.1.6* Extension of Emergency Vent Piping. Piping to or from approved emergency vent devices for atmospheric and low-pressure tanks shall be sized to provide emergency vent flows that limit the back pressure to less than the maximum pressure permitted by the design of the tank. Piping to or from approved emergency vent devices for pressure vessels shall be sized in accordance with the ASME *Boiler and Pressure Vessel Code*.

27.8.2 Vent Piping for Underground Tanks.

27.8.2.1 Vent pipes from underground tanks storing Class I liquids shall be located so that the discharge point is outside of buildings, higher than the fill pipe opening, and not less than 12 ft (3.6 m) above the adjacent ground level.

27.8.2.2 Vent pipe outlets shall be located and directed so that vapors will not accumulate or travel to an unsafe location, enter building openings, or be trapped under eaves and shall be at least 5 ft (1.5 m) from building openings and at least 15 ft (4.5 m) from powered ventilation air intake devices.

27.8.2.3 Vent pipes shall not be obstructed by devices provided for vapor recovery or other purposes unless the tank and associated piping and equipment are otherwise protected to limit back-pressure development to less than the maximum working pressure of the tank and equipment by the provision of pressure-vacuum vents, rupture discs, or other tank-venting devices installed in the tank vent lines.

27.8.2.4 Vent outlets and devices shall be protected to minimize the possibility of blockage from weather, dirt, or insect nests.

27.8.2.5 Vent piping shall be sized in accordance with Table 23.6.2.

27.8.2.6 Vent pipes from tanks storing Class II or Class IIIA liquids shall terminate outside of the building and higher than the fill pipe opening.

27.8.2.7 Vent outlets shall be above normal snow level.

27.8.2.8 Vent pipes shall be permitted to be fitted with return bends, coarse screens, or other devices to minimize ingress of foreign material.

27.8.2.9 Vent pipes and vapor return piping shall be installed without sags or traps in which liquid can collect.

27.8.2.10 Condensate tanks, if utilized, shall be installed and maintained so that blocking of the vapor return piping by liquid is prevented.

27.8.2.11 Vent pipes and condensate tanks shall be located so that they will not be subjected to physical damage. The tank end of the vent pipe shall enter the tank through the top.

27.8.2.12 Where tank vent piping is manifolded, pipe sizes shall be such as to discharge, within the pressure limitations of the system, the vapors they could be required to handle when manifolded tanks are filled simultaneously.

27.8.2.12.1 Float-type check valves installed in tank openings connected to manifolded vent piping to prevent product contamination shall be permitted to be used, provided that the tank pressure will not exceed that permitted by 23.5.3.2 when the valves close.

27.8.2.13 Vent piping for tanks storing Class I liquids shall not be manifolded with vent piping for tanks storing Class II or Class III liquids unless positive means are provided to prevent the following:

(1) Vapors of Class I liquids from entering tanks storing Class II or Class III liquids

(2) Contamination

(3) Possible change in classification of the less volatile liquid

27.9 Bonding and Grounding.

Piping systems shall be bonded and grounded in accordance with 6.5.4.

27.10* Identification and Marking of Piping Systems.

Each loading and unloading riser shall be marked to identify the product for which it is to be used.

27.11 Special Requirements for Marine Piping Systems.

27.11.1 Where piping is from a floating structure or pier, an approved flexible connector shall be permitted between the fixed shore piping and the piping on the floating structure or pier and between separate sections of the floating structure to accommodate changes in water level.

27.11.2 The interior of the flexible connectors shall be compatible with the liquid handled.

27.11.3 The exterior of the flexible connectors shall be resistant to or shielded from salt water and fresh water, ultraviolet radiation, physical damage, and damage by fire.

27.11.4 The flexible connectors shall be suitable for the intended pressures and shall be tested in accordance with Section 27.7.

27.12 Removal from Service of Piping Systems.

Piping systems taken out of service or abandoned shall be temporarily or permanently closed in accordance with this section.

27.12.1 Temporary Closure. (Reserved)

27.12.2 Permanent Closure in Place. (Reserved)

27.12.3 Permanent Removal. (Reserved)

Chapter 28 Bulk Loading and Unloading Facilities for Tank Cars and Tank Vehicles

28.1 Scope.

This chapter shall apply to operations involving the loading or unloading of tank cars and tank vehicles.

28.2 Definitions Specific to Chapter 28. (Reserved)

28.3 General Requirements.

28.3.1 Bonding and Grounding and Stray Currents.

28.3.1.1 Bonding for the control of static electricity shall not be required where the following conditions exist:

(1) Where tank cars and tank vehicles are loaded exclusively with products that do not have static-accumulating properties, such as asphalts (including cutback asphalts), most crude oils, residual oils, and water-soluble liquids

(2) Where no Class I liquids are handled at the loading facility and where the tank cars and tank vehicles loaded are used exclusively for Class II and Class III liquids

(3) Where tank cars and tank vehicles are loaded or unloaded through closed connections

28.3.1.2* Loading and unloading facilities that are used to load liquids into tank vehicles through open domes shall be provided with a means for electrically bonding to protect against static electricity hazards.

28.3.1.2.1 Such means shall consist of a metallic bond wire that is permanently electrically connected to the fill pipe assembly or to some part of the rack structure that is in electrical contact with the fill pipe assembly.

28.3.1.2.2 The free end of this wire shall be provided with a clamp or an equivalent device for convenient attachment to some metallic part that is in electrical contact with the cargo tank of the tank vehicle.

28.3.1.2.3 All parts of the fill pipe assembly, including the drop tube, shall form a continuous electrically conductive path.

28.3.1.3 Loading and unloading facilities that are used to transfer liquids into and from tank cars through open domes shall be protected against stray currents by permanently bonding the fill pipe to at least one rail and to the facility structure, if of metal.

28.3.1.3.1 Multiple pipelines that enter the area shall be permanently bonded together.

28.3.1.3.2 In areas where excessive stray currents are known to exist, all pipelines entering the area shall be provided with insulating sections to electrically isolate them from the facility piping.

Exception: These precautions need not be required where only Class II or Class III liquids are handled and where there is no probability that tank cars will contain vapors from previous cargoes of Class I liquids.

28.3.2 Reserved.

28.4 Location of Loading and Unloading Facilities.

28.4.1 Tank vehicle and tank car loading and unloading facilities shall be separated from aboveground tanks, warehouses, other plant buildings, or the nearest line of adjoining property that can be built upon by a distance of at least 25 ft (7.6 m) for Class I liquids and at least 15 ft (4.6 m) for Class II and Class III liquids, measured from the nearest fill spout or transfer connection.

28.4.2* These distances shall be permitted to be reduced if there is suitable protection for exposures.

28.4.3 Buildings for pumps or shelters for personnel shall be permitted to be a part of the facility.

28.5 Roofed Structures.

A loading or unloading facility that has a canopy or roof that does not limit the dissipation of heat or dispersion of flammable vapors and does not restrict fire-fighting access and control shall be treated as an outdoor facility.

28.6 Fire Protection. (Reserved)

28.7 Emergency Control Systems. (Reserved)

28.8 Electrical Systems.

Electrical wiring and electrical utilization equipment shall comply with Chapter 7.

28.9* Containment, Drainage, and Spill Control.

Loading and unloading facilities shall be provided with drainage systems or other means to contain spills.

28.10 Equipment.

28.10.1 Equipment such as piping, pumps, and meters used for the transfer of Class I liquids between storage tanks and the fill stem of the loading facility shall not be used for the transfer of Class II or Class III liquids unless one of the following conditions exists:

(1) Only water-miscible liquid mixtures are handled, and the class of the mixture is determined by the concentration of liquid in water.

(2) The equipment is cleaned between transfers.

28.10.2 Remote pumps located in underground tanks shall have a listed leak detection device installed on the pump discharge side that will indicate if the piping system is not essentially liquidtight.

28.10.2.1 This device shall be checked and tested at least annually according to the manufacturer's specifications to ensure proper installation and operation.

28.11 Operating Requirements.

28.11.1 Loading and Unloading of Tank Vehicles.

28.11.1.1 Liquids shall be loaded only into cargo tanks whose material of construction is compatible with the chemical characteristics of the liquid. The liquid being loaded shall also be chemically compatible with the liquid hauled on the previous load unless the cargo tank has been cleaned.

28.11.1.2 Before loading tank vehicles through open domes, a bonding connection shall be made to the vehicle or tank before dome covers are raised and shall remain in place until filling is completed and all dome covers have been closed and secured, unless one of the conditions of 28.3.1 exists.

28.11.1.3 When transferring Class I liquids, engines of tank vehicles or motors of auxiliary or portable pumps shall be shut down during the making and breaking of hose connections.

28.11.1.4 If loading or unloading is done without requiring the use of the motor of the tank vehicle, the motor shall be shut down throughout any transfer operations involving Class I liquids.

28.11.1.5* Filling through open domes into tank vehicles that contain vapor-air mixtures within the flammable range or where the liquid being filled can form such a mixture shall be by means of a downspout that extends to within 6 in. (150 mm) of the bottom of the tank unless the liquid is not an accumulator of static electric charges.

28.11.1.6 When top loading a tank vehicle with Class I or Class II liquids without a vapor control system, valves used for the final control of flow shall be of the self-closing type and shall be manually held open except where automatic means are provided for shutting off the flow when the vehicle is full.

28.11.1.6.1 Automatic shutoff systems shall be provided with a manual shutoff valve located at a safe distance from the loading nozzle to stop the flow if the automatic system fails.

28.11.1.6.2 When top loading a tank vehicle with vapor control, flow control shall be in accordance with 28.11.1.8 and 28.11.1.9.

28.11.1.7 When bottom loading a tank vehicle, a positive means shall be provided for loading a predetermined quantity of liquid, together with a secondary automatic shutoff control to prevent overfill.

28.11.1.7.1 The connecting components between the loading rack and the tank vehicle that are required to operate the secondary control shall be functionally compatible.

28.11.1.7.2 The connection between the liquid loading hose or pipe and the tank vehicle piping shall be by means of a dry disconnect coupling.

28.11.1.8 When bottom loading a tank vehicle that is equipped for vapor control, but when vapor control is not used, the tank shall be vented to the atmosphere, at a height not lower than the top of the cargo tank of the vehicle, to prevent pressurization of the tank.

28.11.1.8.1 Connections to the facility's vapor control system shall be designed to prevent the escape of vapor to the atmosphere when the system is not connected to a tank vehicle.

28.11.1.9 When bottom loading is used, reduced flow rates (until the fill opening is submerged), splash deflectors, or other devices shall be used to prevent splashing and to minimize turbulence.

28.11.1.10 Metal or conductive objects, such as gauge tapes, sample containers, and thermometers, shall not be lowered into or suspended in a compartment while the compartment is being filled or immediately after cessation of pumping, in order to permit the relaxation of charge.

28.11.2 Loading and Unloading of Tank Cars.

28.11.2.1 Liquids shall be loaded only into tank cars whose material of construction is compatible with the chemical characteristics of the liquid. The liquid being loaded shall also be chemically compatible with the liquid hauled on the previous load unless the tank car has been cleaned.

28.11.2.2* Filling through open domes into tank cars that contain vapor-air mixtures within the flammable range, or where the liquid being filled can form such a mixture, shall be by means of a downspout that extends to within 6 in. (150 mm) of the bottom of the tank unless the liquid is not an accumulator of static electric charges.

28.11.2.3 When bottom loading is used, reduced flow rates (until the fill opening is submerged), splash deflectors, or other devices shall be used to prevent splashing and to minimize turbulence.

28.11.2.4 Metal or conductive objects, such as gauge tapes, sample containers, and thermometers, shall not be lowered into or suspended in a compartment while the compartment is being filled or immediately after cessation of pumping, in order to permit the relaxation of charge.

28.11.3* Switch Loading. To prevent hazards due to a change in flash point of liquids, any tank car or tank vehicle that has previously contained a Class I liquid shall NOT be loaded with a Class II or Class III liquid unless proper precautions are taken.

Chapter 29 Wharves

29.1 Scope.

29.1.1 This chapter shall apply to all wharves, as defined in 3.3.59, whose primary purpose is the bulk transfer of liquids.

29.1.2 This chapter shall not apply to the following:

(1) Marine service stations, as covered in NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*

(2) Marinas and boatyards, as covered in NFPA 303, *Fire Protection Standard for Marinas and Boatyards*

(3) Wharves that handle liquefied petroleum gas, as covered in NFPA 58, *Liquefied Petroleum Gas Code*, or liquefied natural gas, as covered in NFPA 59A, *Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG)*

29.2 Definitions Specific to Chapter 29. (Reserved)

29.3 General Requirements.

29.3.1 General-purpose wharves that handle bulk transfer of liquids and other commodities shall meet the requirements of NFPA 307, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves*.

29.3.2 Incidental handling of packaged cargo of liquids and loading or unloading of general cargo, such as ships' stores, during transfer of liquids shall be conducted only when approved by the wharf supervisor and the senior officer of the vessel.

29.3.3 Wharves at which liquid cargoes are to be transferred in bulk to or from tank vessels shall be at least 100 ft (30 m) from any bridge over a navigable waterway or from any entrance to or superstructure of a vehicular or railroad tunnel under a waterway.

29.3.4 The termination of the loading or unloading fixed piping shall be at least 200 ft (60 m) from any bridge or from any entrance to or superstructure of a tunnel.

29.3.5 The substructure and deck of the wharf shall be designed for the use intended.

29.3.6 The deck of the wharf shall be permitted to be of any material that will afford the desired combination of flexibility, resistance to shock, durability, strength, and fire resistance.

29.3.7 Heavy timber construction shall be permitted.

29.3.8 Tanks used exclusively for ballast water or Class II or Class III liquids shall be permitted to be installed on a wharf designed to support the weight of the tank and its contents.

29.3.9 Loading pumps capable of building up pressures that exceed the safe working pressure of cargo hose or loading arms shall be provided with bypasses, relief valves, or other arrangements to protect the loading facilities against excessive pressure.

29.3.9.1 Relief devices shall be tested at least annually to determine that they function satisfactorily at their set pressure.

29.3.10 All pressure hose and couplings shall be inspected at intervals recommended by the manufacturer for the service in which they are used.

29.3.10.1 With the hose extended, the hose and couplings shall be tested using the in-service maximum operating pressure.

29.3.10.2 Any hose showing material deterioration, signs of leakage, or weakness in its carcass or at the couplings shall be withdrawn from service and repaired or discarded.

29.3.11 Piping, valves, and fittings shall meet applicable requirements of Chapter 27 and shall also meet the following requirements:

(1) Flexibility of piping shall be assured by layout and arrangement of piping supports so that motion of the wharf structure resulting from wave action, currents, tides, or the mooring of vessels will not subject the piping to excessive strain.

(2) Pipe joints that depend on the friction characteristics of combustible materials or on the grooving of pipe ends for mechanical continuity of piping shall not be permitted.

(3) Swivel joints shall be permitted to be used in piping to which hose are connected and for articulated swivel-joint transfer systems, provided the design is such that the mechanical strength of the joint will not be impaired if the packing materials should fail, for example, by exposure to fire.

(4) Each line conveying Class I or Class II liquids leading to a wharf shall be provided with a readily accessible block valve located on shore near the approach to the wharf and outside of any diked area. Where more than one line is involved, the valves shall be grouped in one location.

(5) Means shall be provided for easy access to any cargo line valves that are located below the wharf deck.

29.3.12 Pipelines on wharves that handle Class I or Class II liquids shall be bonded and grounded.

29.3.12.1 Insulating flanges or joints shall be installed for protection against stray currents.

29.3.12.2 Bonding and grounding connections on all pipelines shall be located on the wharf side of insulating flanges, if used, and shall be accessible for inspection.

29.3.12.3 Bonding between the wharf and the vessel shall not be required.

29.3.13 Hose or articulated swivel-joint pipe connections used for cargo transfer shall be capable of accommodating the combined effects of change in draft and change in tide. Hose shall be supported to avoid kinking and damage from chafing.

29.3.14 Mooring lines shall be kept adjusted to prevent surge of the vessel from placing stress on the cargo transfer system.

29.3.15 Material shall not be placed on wharves in such a manner as to obstruct access to fire-fighting equipment or important pipeline control valves.

29.3.16 Where the wharf is accessible to vehicle traffic, an unobstructed roadway to the shore end of the wharf shall be maintained for access of fire-fighting apparatus.

29.3.17 Loading or unloading shall not commence until the wharf supervisor and the person in charge of the tank vessel agree that the tank vessel is properly moored and all connections are properly made.

29.3.18 Mechanical work shall not be performed on the wharf during cargo transfer, except under special authorization based on a review of the area involved, methods to be employed, and precautions necessary.

29.3.19 Sources of ignition shall be controlled during transfer of liquids.

29.3.20 Vehicular traffic and mechanical work including, but not limited to, welding, grinding, and other hot work, shall not be performed during cargo transfer except as authorized by the wharf supervisor and the senior officer on the vessel.

29.3.21 Smoking shall be prohibited at all times on the wharf during cargo transfer operations.

29.3.22 For marine terminals handling flammable liquids, Figure 29.3.22 shall be used to determine the extent of classified areas for the purpose of installation of electrical equipment.

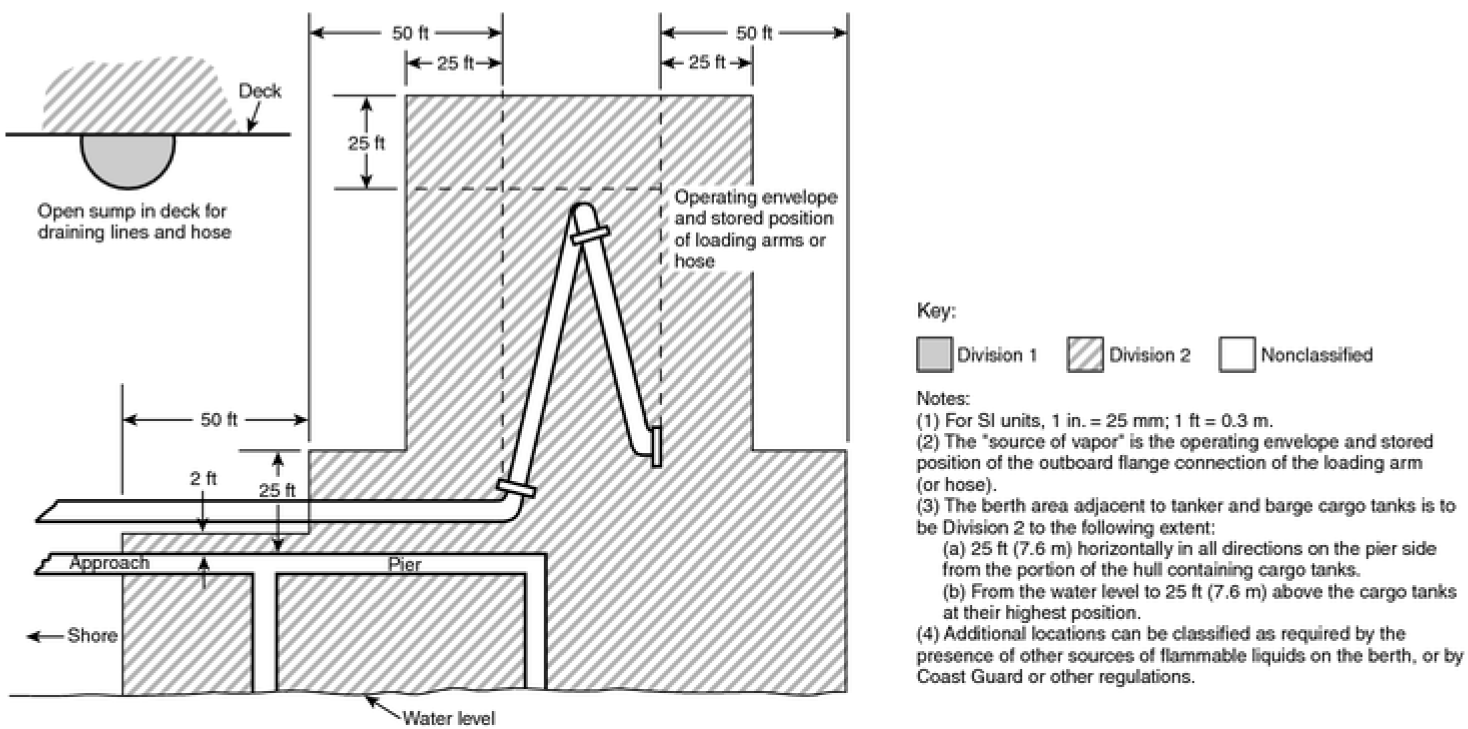


FIGURE 29.3.22 Area Classification for a Marine Terminal Handling Flammable Liquids.

29.3.23 Where a flammable atmosphere can exist in the vessel cargo compartment, cargo transfer systems shall be designed to limit the velocity of the incoming liquid stream to 3 ft (0.9 m) per second until the compartment inlet opening is sufficiently submerged to prevent splashing.

29.3.24 Filters, pumps, wire screens, and other devices that can produce static electric charges through turbulence shall be so located to allow a minimum of 30 seconds of relaxation time prior to discharging cargo into the compartment.

29.3.25* Spill collection shall be provided around manifold areas to prevent spread of liquids to other areas of the wharf or under the wharf.

29.3.26 Vapor seals shall be provided on all drain lines leaving the wharf.

29.3.27 Where required, wharves shall have a system to isolate and shut down the loading operation in the event of failure of a hose, loading arm, or manifold valve. This system shall meet all of the following requirements:

(1) If the protective system closes a valve on a gravity-fed or pipeline-fed loading system, it shall be designed to ensure the line is not subjected to damage from pressure surges.

(2) Emergency shutdown systems shall be permitted to be automatically or manually activated.

29.3.27.1 Manually activated device(s) shall be identified and accessible during an emergency.

29.3.28* Fire protection for wharves shall be related to the products being handled, emergency response capability, size, location, frequency of use, and adjacent exposures.

29.3.28.1 Where a fire water main is provided, the main shall be permitted to be wet or dry. In all cases, isolation valves and fire department connections shall be provided at the wharf-to-shore connection.

29.3.28.2 Where a fire water main is provided, hydrants and monitors shall also be provided so that effective fire water streams can be applied to any berth or loading manifold from two directions.

29.3.28.3 Fire water pumps, fire hose, fire water mains, foam systems, and other fire suppression equipment shall be maintained and tested in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

29.3.28.4 Where no fire water main is provided, at least two 150 lb (68 kg) dry chemical extinguishers shall be provided. The extinguishers shall be located within 50 ft (15 m) of pump or manifold areas and shall be easily reached along emergency access paths.

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1.1 This code is recommended for use as the basis for legal regulations. Its provisions are intended to reduce the hazard to a degree consistent with reasonable public safety, without undue interference with public convenience and necessity, of operations that require the use of flammable and combustible liquids. Compliance with this code does not eliminate all hazards in the use of flammable and combustible liquids. *(See the Flammable and Combustible Liquids Code Handbook for additional explanatory information.)*

A.1.1.2(1) Liquids that are solid at 100°F (37.8°C) or above, but are handled, used, or stored at temperatures above their flash points, should be reviewed against pertinent sections of this code.

A.1.1.2(2) The information in A.1.1.2(1) also applies here.

A.1.1.2(4) Certain mixtures of flammable or combustible liquids and halogenated hydrocarbons either do not exhibit a flash point using the standard closed-cup test methods or will exhibit elevated flash points. However, if the halogenated hydrocarbon is the more volatile component, preferential evaporation of this component can result in a liquid that does have a flash point or has a flash point that is lower than the original mixture. In order to evaluate the fire hazard of such mixtures, flash point tests should be conducted after fractional evaporation of 10, 20, 40, 60, or even 90 percent of the original sample or other fractions representative of the conditions of use. For systems such as open process tanks or spills in open air, an open-cup test method might be more appropriate for estimating the fire hazard.

A.1.1.2(5) See NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products*.

A.1.1.2(7) Requirements for transportation of flammable and combustible liquids can be found in NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids*, and in the U.S. Department of Transportation's Hazardous Materials Regulations, Title 49, Code of Federal Regulations, Parts 100–199.

A.1.1.2(8) See NFPA 31, *Standard for the Installation of Oil-Burning Equipment*.

A.1.2 Requirements for the safe storage and use of many flammable and combustible liquids commonly available depend primarily on their fire characteristics, particularly the flash point, which is the basis for the classification system described in Chapter 4. It should be noted that a liquid's classification can be changed by contamination. For example, placing a Class II liquid into a tank that last contained a Class I liquid can change the flash point of the former so that it falls into the range of a Class I liquid. The same situation can exist where a Class II liquid is exposed to the vapors of a Class I liquid via an interconnecting vapor line. *(See 27.8.1.5 and 27.8.2.13.)* Care should be exercised in such cases to apply the requirements appropriate to the actual classification. Refer to *Fire Protection Guide to Hazardous Materials* for flash point and other fire hazard data.

The volatility of a liquid is increased by heating. Where Class II or Class III liquids are exposed to storage conditions, use conditions, or process operations where they are naturally or artificially heated up to or above their flash points, additional fire safety features, such as ventilation, separation from ignition sources, diking, or electrical area classification, might be necessary.

Additional fire safety considerations might also be necessary for the safe storage and use of liquids that have unusual burning characteristics, that are subject to self-ignition when exposed to air, that are highly reactive with other substances, that are subject to explosive decomposition, or that have other special properties that dictate safeguards over and above those specified for a normal liquid of similar flash point classification.

A.1.4.2 An existing situation involving a distinct hazard to life or adjacent property includes conditions that might result in an explosion or sudden escalation of a fire. Examples include but are not limited to inadequate ventilation of confined spaces, lack of adequate emergency venting of a tank, failure to fireproof the supports of elevated tanks, or lack of drainage or dikes to control spills.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.2.3 Code. The decision to designate a standard as a "code" is based on such factors as the size and scope of the document, its intended use and form of adoption, and whether it contains substantial enforcement and administrative provisions.

A.3.2.5 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A.3.3.5 Boil-Over. Boil-over occurs when the residues from surface burning become more dense than the unburned oil and sink below the surface to form a hot layer, which progresses downward much faster than the regression of the liquid surface. When this hot layer, called a "heat wave," reaches water or water-in-oil emulsion in the bottom of the tank, the water is first superheated and then boils almost explosively, overflowing the tank. Oils subject to boil-over consist of components having a wide range of boiling points, including both light ends and viscous residues. These characteristics are present in most crude oils and can be produced in synthetic mixtures.

A boil-over is an entirely different phenomenon from a slop-over or froth-over. Slop-over involves a minor frothing that occurs when water is sprayed onto the hot surface of a burning oil. Froth-over is not associated with a fire but results when water is present or enters a tank containing hot viscous oil. Upon mixing, the sudden conversion of water to steam causes a portion of the tank contents to overflow.

A.3.3.6.1 Important Building. Examples of important buildings include occupied buildings where egress within 2 minutes cannot be reasonably expected and control buildings that require presence of personnel for orderly shutdown of important or hazardous processes. Important buildings can also include unprotected storage where products from fire can harm the community or the environment or buildings that contain high-value contents or critical equipment or supplies.

A.3.3.10 Container. The U.S. DOT defines *non-bulk packaging* as having up to 119 gal (450 L) capacity in 49 CFR 171.8.

A.3.3.10.3 Nonmetallic Container. Permissible nonmetallic containers for shipping Class I, Class II, and Class IIIA liquids are governed by the hazardous materials transportation regulations promulgated by the United Nations publication *Recommendations on the Transport of Dangerous Goods* and the U.S. Department of Transportation's Hazardous Materials Regulations. Small tanks for Class IIIB liquids are not governed by these regulations. Fiber portable tanks for Class IIIB liquids include composite designs consisting of a multi-ply cardboard box with a rigid or flexible plastic bladder.

A.3.3.10.4 Nonmetallic Intermediate Bulk Container. Permissible nonmetallic intermediate bulk containers for shipping Class I, Class II, and Class IIIA liquids are governed by the hazardous materials transportation regulations promulgated by the United Nations publication *Recommendations on the Transport of Dangerous Goods* and the U.S. Department of Transportation's Hazardous Materials Regulations. Intermediate bulk containers for Class IIIB liquids are not governed by these regulations. Fiber intermediate bulk containers for Class IIIB liquids include composite designs consisting of a cardboard box with a flexible plastic bladder, which is commonly referred to as a "bag-in-box" container.

A.3.3.20 Fugitive Emissions. These include leaks from pump seals, valve packing, flange gaskets, compressor seals, process drains, and so forth.

A.3.3.21 Hazardous Material or Hazardous Chemical. These dangers can arise from, but are not limited to, toxicity, reactivity, instability, or corrosivity.

A.3.3.23 Hazardous Reaction or Hazardous Chemical Reaction. These dangers might include, but are not limited to, toxic effects, reaction speed (including detonation), exothermic reaction, or production of unstable or reactive materials.

A.3.3.30.2 Flammable Liquid. For the purposes of this code, a material with a Reid vapor pressure greater than an absolute pressure of 40 psi (276 kPa) is considered to be a gas and is, therefore, not within the scope of NFPA 30. See NFPA 58, *Liquefied Petroleum Gas Code*.

A.3.3.30.5 Water-Miscible Liquid. Liquids that are water-miscible include low molecular weight (3 carbons or less) alcohols, such as methyl alcohol, ethyl alcohol, n-propyl alcohol, isopropyl alcohol, and allyl alcohol. Acetone and tert-butyl alcohol are also water-miscible.

When water-miscible flammable liquids are mixed with water, a homogeneous solution is formed. The flash point, fire point, heat of combustion, and heat release rate for the solution will be different from the pure liquid. The flash point and fire point of the solution will increase as the water concentration increases. At a certain water concentration, which varies for different liquids, the fire point will no longer exist and the solution will no longer present a fire hazard.

A.3.3.34 Maximum Allowable Quantity (MAQ). Quantities of flammable and combustible liquids are permitted to exceed the MAQs when they are located in an area that complies with Protection Levels 2 and 3 in accordance with this code and with the building code.

A.3.3.37 Operating Unit (Vessel) or Process Unit (Vessel). Unit operations include, but are not limited to, distillation, oxidation, cracking, and polymerization.

A.3.3.39 Pier. The terms *pier* and *wharf* are used interchangeably. [**307,** 2006]

A.3.3.41 Process or Processing. The sequence can include both physical and chemical operations, unless the term is modified to restrict it to one or the other. The sequence can involve, but is not limited to, preparation, separation, purification, or change in state, energy content, or composition.

A.3.3.44 Safety Can. Safety cans listed to ANSI/UL 30, *Standard for Metal Safety Cans,* are limited to 5 U.S. gal (19 L). ANSI/UL 1313, *Standard for Nonmetallic Safety Cans for Petroleum Products,* allows for capacities up to 5 Imperial gal (23 L).

A.3.3.47.2 Atmospheric Tank. Older-style flat roof tanks were designed to operate at pressures from atmospheric through a gauge pressure of 0.5 psi (3.5 kPa), measured at the top of the tank. This limitation was established to avoid continuous stress on the roof plates of the tank.

A.3.3.47.5.1 Nonmetallic Portable Tank. Permissible nonmetallic portable tanks for shipping Class I, Class II, and Class IIIA liquids are governed by hazardous materials transportation regulations promulgated by the United Nations (UN) and the U.S. Department of Transportation (DOT). Small tanks for Class IIIB liquids are not governed by either UN or DOT hazardous materials regulations. Fiber portable tanks for Class IIIB liquids include composite designs consisting of a multi-ply corrugated box with a rigid or flexible inner plastic bladder.

A.3.3.52 Vapor Processing System. Examples are systems using blower-assist for capturing vapors and refrigeration, absorption, and combustion systems for processing vapors.

A.3.3.53 Vapor Recovery System. Examples are balanced-pressure vapor displacement systems and vacuum-assist systems without vapor processing.

A.3.3.57 Ventilation. Ventilation can be achieved by introduction of fresh air to dilute contaminated air or by local exhaust of contaminated air. Ventilation is considered adequate if it is sufficient to prevent accumulation of significant quantities of vapor-air mixtures in concentrations over one-fourth of the lower flammable limit (LFL).

A.3.3.58 Warehouse. Warehousing operations referred to in these definitions are those operations not accessible to the public and include general-purpose, merchandise, distribution, and industrial warehouse–type operations.

A.3.3.59 Wharf. The terms *wharf* and *pier* are used interchangeably. [**307,** 2006]

A.4.2.1 At the boiling point, the surrounding atmospheric pressure can no longer hold the liquid in the liquid state and the liquid boils. A low boiling point is indicative of a high vapor pressure and a high rate of evaporation.

A.4.2.4 Flash point is a direct measure of a liquid's ability to emit flammable vapors. The lower the flash point, the greater the risk of fire. Flash point is determined using one of several different test procedures and apparatus that are specified in Section 4.4.

A liquid that has a flash point at or below ambient temperature is easy to ignite and will burn quickly. On ignition, the spread of flame over the surface of such a liquid will be rapid, because it is not necessary for the fire to expend energy heating the liquid to generate more vapor. Gasoline is a familiar example. A liquid with a flash point above ambient temperature presents less risk because it must be heated to generate enough vapor to become ignitible; it is more difficult to ignite and presents less potential for the generation and spread of vapor. A common example is home heating oil (Fuel Oil No. 2). Home heating oil must be atomized to a fine mist in order for it to be easily ignited.

Certain solutions of liquids in water exhibit a flash point using the standard closed-cup test procedures but will not burn and could even extinguish a fire. To assist identifying such solutions, the following standards are helpful:

(1) ASTM D 4207, *Standard Test Method for Sustained Burning of Low Viscosity Liquid Mixtures by the Wick Test*

(2) ASTM D 4206, *Standard Test Method for Sustained Burning of Liquid Mixtures Using the Small Scale Open-Cup Apparatus*

Liquid mixtures that do not sustain combustion for a specified time at a specified temperature are considered to be noncombustible. The tests described in the references listed in A.4.2.4(1) and A.4.2.4(2) provide additional data for determining proper storage and handling of such mixtures. In a confined space, such mixtures could still create an ignitible vapor–air mixture, depending on the amount of flammable liquid in the mixture and the quantity of the spill.

Related to the flash point is the fire point. The fire point of a liquid is the temperature at which ignition of vapors will result in continued burning. As the term *flash point* suggests, the vapors generated at that temperature will flash but will not necessarily continue to burn. The difference between flash point and fire point has some significance when conducting flash point tests [see 9.1.4(5) and 9.1.4(6)]. However, a closed-cup flash point is used to classify the liquid and characterize its hazard.

For more information, see ASTM E 502, *Standard Test Method for Selection and Use of ASTM Standards for the Determination of Flash Point of Chemicals by Closed Cup Methods*, and the ASTM *Manual on Flash Point Standards and Their Use*.

A.4.2.6 Vapor pressure is a measure of the pressure that the liquid exerts against the atmosphere above it. Just as the atmosphere exerts pressure on the surface of the liquid, the liquid pushes back. Vapor pressure is normally less than atmospheric pressure and is a measure of the liquid's tendency to evaporate (i.e., to move from the liquid to the gaseous state). This tendency is also referred to as volatility, thus the use of the term *volatile* to describe liquids that evaporate very easily. The higher the vapor pressure, the greater the rate of evaporation and the lower the boiling point. Simply put, this means more vapors and increased fire risk.

A.4.3 The classification of liquids is based on flash points that have been corrected to sea level, in accordance with the relevant ASTM test procedures. At high altitudes, the actual flash points will be significantly lower than those either observed at sea level or corrected to atmospheric pressure at sea level. Allowances could be necessary for this difference in order to appropriately assess the risk.

Table A.4.3 presents a comparison of the definitions and classification of flammable and combustible liquids, as set forth in Chapter 4 of this code, with similar definitions and classification systems used by other regulatory bodies.

The Hazardous Materials Regulations of the U.S. Department of Transportation (DOT), as set forth in the 49 CFR 173.120(b)(2) and 173.150(f), provide an exception whereby a flammable liquid that has a flash point between 37.8°C (100°F) and 60.5°C (141°F) and does not also meet the definition of any other DOT hazard class can be reclassified as a combustible liquid [i.e., one having a flash point above 60.5°C (141°F)] for shipment by road or rail within the United States.

Table A.4.3 Comparative Classification of Liquids

		Agency Flash Point				NFPA Flash Point	
Agency	Agency Classification	°F	°C	NFPA Definition	NFPA Classification	°F	°C

Table A.4.3 Comparative Classification of Liquids

Agency	Agency Classification	Agency Flash Point °F	Agency Flash Point °C	NFPA Definition	NFPA Classification	NFPA Flash Point °F	NFPA Flash Point °C
ANSI/CMA Z129.1	Flammable	<141	<60.5	Flammable	Class I	<100	<37.8
				Combustible	Class II	≥100 to <140	≥37.8 to <60
					Class IIIA	≥140 to <200	≥60 to <93
	Combustible	≥141 to <200	≥60.5 to <93	Combustible	Class IIIA	≥140 to <200	≥60 to <93
DOT	Flammable	<141	<60.5	Flammable	Class I	<100	<37.8
				Combustible	Class II	≥100 to <140	≥37.8 to <60
					Class IIIA	≥140 to <200	≥60 to <93
	Combustible	≥141 to <200	≥60.5 to <93	Combustible	Class IIIA	≥140 to <200	≥60 to <93
DOT HM-181 Domestic Exemption*	Flammable	<100	<37.8	Flammable	Class I	<100	<37.8
	Combustible	≥100 to <200	≥37.8 to <93	Combustible	Class II	≥100 to <140	≥37.8 to <60
					Class IIIA	≥140 to <200	≥60 to <93
UN	Flammable	<141	<60.5	Flammable	Class I	<100	< 37.8
				Combustible	Class II	≥100 to <140	≥37.8 to <60
					Class IIIA	≥140 to <200	≥60 to <93
	Combustible	≥141 to <200	≥60.5 to <93	Combustible	Class II	≥100 to <140	≥37.8 to <60
					Class IIIA	≥140 to <200	≥60 to <93
OSHA	Flammable	<100	<37.8	Flammable	Class I	<100	<37.8
	Combustible†	≥100	≥37.8	Combustible	Class II	≥100 to <140	≥37.8 to <60
					Class IIIA	≥140 to <200	≥60 to <93
					Class IIIB†	≥200	≥93

*See A.4.3.

†See 29 CFR 1910.106 for Class IIIB liquid exemptions.

A.6.1 These provisions might not provide adequate protection for all operations involving hazardous materials or chemical reactions, nor do they consider health hazards resulting from exposure to such materials.

A.6.3 The evaluation for management of fire hazards should consider probability of an ignitible mixture, the presence of a credible ignition source, and consequences of an ignition. Where the risk is unacceptable to the authority having jurisdiction, explosion protection in accordance with NFPA 69, *Standard on Explosion Prevention Systems*, or deflagration venting in accordance with NFPA 68, *Standard on Explosion Protection by Deflagration Venting*, or a combination of the two should be provided. See also *Guidelines for Chemical Process Quantitative Risk Analysis*, 2nd edition, from the Center for Chemical Process Safety/American Institute of Chemical Engineers.

A.6.4.1.1 The wide range in size, design, and location of liquid-processing facilities precludes the inclusion of detailed fire prevention and control systems and methods applicable to all such facilities.

A.6.5.3 See NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*.

A.6.5.4 The prevention of electrostatic ignition in equipment is a complex subject. Refer to NFPA 77, *Recommended Practice on Static Electricity*, for guidance.

A.6.6.1 One method of complying with this requirement could be through the installation of an automatic and/or manual fire alarm system as covered in *NFPA 72, National Fire Alarm Code*.

A.6.7.1 Other recognized fire prevention and control factors, involving construction, location, and separation, are addressed elsewhere in this chapter.

A.6.7.3 Permanent connections to process water lines from the fire water system present an opportunity for contamination of the fire water with process fluids. Incidents have occurred where fire water was contaminated with flammable process liquids, with subsequent increased fire damage and, in some cases, injury. Temporary connections are permitted to meet extraordinary needs, as in turnaround and inspection periods, tank cleaning, and so forth. However, care should be taken to address the potential for contamination. Where such use occurs frequently enough to justify a more robust arrangement, double block-and-bleed valves, removable spool pieces, or other means should be used to assure that no contamination can occur. Check valves alone are not sufficient.

Use of utility water sources, such as boiler feedwater, that are not contaminated, is acceptable for use as a supplemental fire water supply.

A.6.7.5 See NFPA 13, *Standard for the Installation of Sprinkler Systems*, and NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, for information on these subjects.

A.6.7.8 NFPA 10, *Standard for Portable Fire Extinguishers*, provides information on the suitability of various types of extinguishers.

A.7.3.3 For additional information, see NFPA 497, *Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*.

A.7.3.7 NFPA 496, *Standard for Purged and Pressurized Enclosures for Electrical Equipment*, provides details for these types of installations.

A.9.3.10.3 Paragraph 4.2.3.2 of NFPA 505, *Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations*, states "In locations used for the storage of flammable liquids in sealed containers or liquefied or compressed flammable gases in containers, approved power-operated industrial trucks designated as Types CNS, DS, ES, GS, LPS, GS/CNS, or GS/LPS shall be permitted to be used where approved by the authority having jurisdiction." Compared to the above types, industrial trucks that are designated DY and EE have significantly less potential for igniting flammable vapors (such as might result from a spill of Class I liquid) and should be used in inside liquid storage areas where conditions warrant.

A.9.4.1 It is not the intent of Section 9.4 to regulate containers and packaging systems for Class IIIB liquids, except as required for protected storage in accordance with Chapter 16.

A.9.4.1(5) The term *rigid nonmetallic intermediate bulk container* is used to describe intermediate bulk containers that have a plastic vessel that serves as the primary liquid-holding component. This vessel can be enclosed in or encased by an outer structure consisting of a steel cage, a single-wall metal or plastic enclosure, a double wall of foamed or solid plastic, or a paperboard enclosure. These are often called *composite IBCs*, which is the term used by the U.S. Department of Transportation (DOT) to describe them. The term *rigid nonmetallic intermediate bulk container* also denotes an all-plastic single-wall IBC that might or might not have a separate plastic base and for which the containment vessel also serves as the support structure. IBCs that have an outer liquidtight metal structure are considered to be metal IBCs or metal portable tanks by DOT and are defined in 9.4.1(1).

A.9.5 The requirements in Section 9.5 are based on hazards associated with fixed flammable liquids storage cabinets. They do not address potential hazards associated with mobile storage cabinets (i.e., cabinets with integral wheels) such as the following:

(1) Increased risk of spills

(2) Potential for tipover or blockage of egress

(3) Maintenance of vent and grounding integrity

(4) Variable condition of exposed floor surfaces under the cabinet

A.9.5.4 Venting of storage cabinets has not been demonstrated to be necessary for fire protection purposes. Additionally, venting a cabinet could compromise the ability of the cabinet to adequately protect its contents from involvement in a fire, because cabinets are not generally tested with any venting. Therefore, venting of storage cabinets is not recommended.

However, it is recognized that some jurisdictions might require storage cabinets to be vented and that venting can also be desirable for other reasons, such as health and safety. In such cases, the venting system should be installed so as to not affect substantially the desired performance of the cabinet during a fire. Means of accomplishing this can include thermally actuated dampers on the vent openings or sufficiently insulating the vent piping system to prevent the internal temperature of the cabinet from rising above that specified. Any make-up air to the cabinet should also be arranged in a similar manner.

If vented, the cabinet should be vented from the bottom with make-up air supplied to the top. Also, mechanical exhaust ventilation is preferred and should comply with NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*. Manifolding the vents of multiple storage cabinets should be avoided.

A.9.8.1 The Protection Level classifications are taken from *NFPA 5000, Building Construction and Safety Code*. Protection Levels 1, 4, and 5 do not apply to the storage of flammable and combustible liquids and are therefore not extracted here.

A.9.8.2 See *NFPA 5000, Building Construction and Safety Code*, for additional requirements.

A.9.13 Spill containment can be accomplished by any of the following:

(1) Noncombustible, liquidtight raised sills, curbs, or ramps of suitable height at exterior openings

(2) Noncombustible, liquidtight raised sills, curbs, or ramps of suitable height, or other flow-diverting structures at interior openings

(3) Sloped floors

(4) Open-grate trenches or floor drains that are connected to a properly designed drainage system

(5) Wall scuppers that discharge to a safe location or to a properly designed drainage system

(6) Other means that are acceptable to the authority having jurisdiction

Where sills, curbs, or ramps are used, the appropriate height will depend on a number of factors, including the maximum expected spill volume, the floor area, and the existence of any drainage systems. Historically, curbs and sills have been 4 in. (100 mm) high.

A variety of curb, sill, and ramp heights can be used to obtain the desired containment volume. As a guide, 1 ft^2 of water at a depth of 1 in. equals 0.6 gal (1 m^2 of water @ 25 mm = 25 L). Once the total quantity of liquid containment has been established, the necessary curb, sill, or ramp height can then be calculated.

Where open-grate trenches are used, the volume of the trench should be able to contain the maximum expected spill volume or otherwise be connected to a properly designed drainage system.

It should be noted that these containment and drainage provisions address only fire protection concerns. Consult the appropriate environmental regulations for other restrictions that could apply.

A.9.16.1 Release of a Class IA liquid into a room or enclosure can result in the evolution of large quantities of flammable vapor. The ignition of this flammable mixture can result in a significant pressure rise, the production of hot combustion gases, and flame. Failure to adequately design a room or building for this type of event can result in the failure of the room or building walls and/or roof and the uncontrolled release of the hot combustion gases, flames, and pressure. An acceptable method of protection against this type of event is the use of damage-limiting construction consisting of a combination of pressure-relieving construction and pressure-resistant construction as described in NFPA 68, *Standard on Explosion Protection by Deflagration Venting*.

A.9.16.2 Unstable liquids can create deflagration or detonation hazards. A complete engineering review of the type of explosion event that might be produced by an unstable liquid is needed to define the necessary protection measures. Protection measures for detonations require construction features such as barricades.

A.10.3.6 Use of a liquid storage room or a hazardous material storage locker used as an inside area is not mandated for the storage of liquids in a mercantile occupancy where the quantities in Table 10.7.1 are not exceeded. Where the construction of such spaces is utilized within a mercantile occupancy, guidance is provided in Chapter 9.

A.12.8.1 The provision of automatic sprinklers designed to protect Class IV commodities to a height of 20 ft (6 m) for the liquid storage quantities and arrangements allowed in a general-purpose warehouse should not be construed as providing adequate protection. Fire tests utilizing such design criteria on the allowed storage arrangements have never been conducted, and other test results imply that control of a liquid pool fire might not be obtained. Examples of fire protection can be found in Chapter 16.

A.12.8.4 **Exception No. 2.** This exception is based on work done by FM Global, which showed that flammable liquids in plastic containers could cause uncontrollable fires under certain conditions of storage in general-purpose warehouses. A research project on flammable liquids container storage carried out by Underwriters Laboratories Inc., under the auspices of the National Fire Protection Research Foundation, has suggested a test protocol that can judge the capability of packaging systems to withstand a small ignition source or to minimize the rate at which the lading is released from the containers, so that the fire can be controlled by automatic sprinklers.

A.14.1 Environmental concerns have dictated special handling of hazardous materials, chemicals, and wastes. Some of these have flammable and combustible liquid characteristics, in addition to their environmental and health problems, thus causing some questions as to how they should be stored and handled.

Several manufacturers have met this problem by designing and manufacturing movable, modular prefabricated storage lockers, working diligently with various building officials and authorities having jurisdiction. This results in a product that is intended to meet government standards and regulations for hazardous materials storage. Several municipalities have passed model ordinances covering the design, construction, and location of hazardous materials storage lockers. Design features can include, but are not limited to, the following:

(1) Secondary spill containment sumps

(2) Deflagration venting

(3) Ventilation requirements, including mechanical ventilation where dispensing operations are expected

(4) Electrical equipment for hazardous locations in accordance with NFPA 70, *National Electrical Code*

(5) Static electricity control

(6) Fire suppression systems (dry chemical or sprinklers)

(7) Heavy structural design for the following:

    (a) Security provisions

    (b) Doors that lock and permit pallet loading

    (c) Wind load, snow load, and storage load conditions

    (d) Anchorage provisions

    (e) Skid design, permitting relocation using lift trucks

(8) Fire-related exterior walls, if required

(9) Interior partitions to segregate incompatible materials

(10) Size limits to limit quantities that can be stored within preassembled or ready-to-assemble designs

(11) Nonsparking floors

(12) Shelving, if required

(13) Heating or cooling units, if needed

(14) Corrosion protection as required

(15) Employee safety provisions (eye/face wash)

(16) NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, hazard symbols

Features provided are determined by specific storage requirements and needs of the owner, keeping in mind applicable regulations and ordinances that apply and the approval requirements of the authority having jurisdiction.

Several testing laboratories have developed internal procedures for the examination, testing, and listing or labeling of hazardous materials storage lockers submitted by manufacturers.

A.16.1.1 See Annex E for limitations of the protection criteria of Table 16.5.2.1 through Table 16.5.2.12, particularly for intermediate bulk containers and portable tanks having capacities greater than 60 gal (230 L).

Protected storage allowed under previous editions of this code can be continued if the class of liquids stored, the quantity of liquids stored, fire protection, and building configuration remain unchanged. Table A.16.1.1(a) and Table A.16.1.1(b), reprinted here from the 1993 edition of this code, can be used as a reference for storage arrangements in previously approved, protected, inside liquid storage areas.

For certain liquids such as ketones, esters, and alcohols, the minimum required densities established in the listing criteria for foam discharge devices are often higher than the general densities specified for protection of flammable and combustible liquids. When determining the design criteria for extinguishing systems using foam, it is important to ensure that the listing criteria, which are typically based on empirical data from fire tests, are not overlooked. Otherwise, the fire protection system design can be inadequate for proper protection.

Early suppression fast-response (ESFR) sprinklers have been tested for protection of liquids only to the extent reflected in the tables in Section 16.5. Any other use of ESFR sprinklers for protection of liquids should be based on an engineering analysis that evaluates the potential failure of the sprinkler system based on a rapid-growth fire or a large pool fire that would operate more sprinklers than are accommodated by the design area. The use of ESFR protection, particularly without provisions for the control of spread of liquid, presents the possibility of a liquid pool fire that could exceed the limited design operating area of an ESFR system.

The information in Table 16.5.2.1 through Table 16.5.2.12 was developed from full-scale fire tests. Where only one K-factor sprinkler is allowed, this was the only size proven to provide fire control. Where a choice of K-factors is allowed by the tables, each was able to provide fire control; however, the larger K-factor sprinklers sometimes demonstrated better fire control and further limited fire damage. Where only one response type of sprinkler is allowed, this is the only type of sprinkler proven to provide fire control. Where a choice of response characteristics (SR or QR) is allowed by the tables, each was able to provide fire control; however, the QR sprinklers sometimes demonstrated better fire control and further limited fire damage.

In the testing involving metal containers, only steel containers were tested. Other metal containers, such as aluminum, have not been tested.

Table A.16.1.1(a) Storage Arrangements for Protected Palletized or Solid Pile Storage of Liquids in Containers and Portable Tanks

		Maximum Storage Height (ft)		Maximum Quantity per Pile (gal)		Maximum Quantity[a] (gal)	
Liquid Class	**Storage Level**	**Containers**	**Portable Tanks**	**Containers**	**Portable Tanks**	**Containers**	**Portable Tanks**
IA	Ground floor	5	—	3,000	—	12,000	—
	Upper floors	5	—	2,000	—	8,000	—
	Basement	NP	NP	—	—	—	—
IB	Ground floor	6½	7	5,000	20,000	15,000	40,000
	Upper floors	6½	7	3,000	10,000	12,000	20,000

Table A.16.1.1(a) Storage Arrangements for Protected Palletized or Solid Pile Storage of Liquids in Containers and Portable Tanks

Liquid Class	Storage Level	Maximum Storage Height (ft)		Maximum Quantity per Pile (gal)		Maximum Quantity[a] (gal)	
		Containers	Portable Tanks	Containers	Portable Tanks	Containers	Portable Tanks
	Basement	NP	NP	—	—	—	—
IC	Ground floor	6½[b]	7	5,000	20,000	15,000	40,000
	Upper floors	6½[b]	7	3,000	10,000	12,000	20,000
	Basement	NP	NP	—	—	—	—
II	Ground floor	10	14	10,000	40,000	25,000	80,000
	Upper floors	10	14	10,000	40,000	25,000	80,000
	Basement	5	7	7,500	20,000	7,500	20,000
III	Ground floor	20	14	15,000	60,000	55,000	100,000
	Upper floors	20	14	15,000	60,000	55,000	100,000
	Basement	10	7	10,000	20,000	25,000	40,000

For SI units, 1 ft = 0.3 m; 1 gal = 3.8 L.

NP: Not permitted.

[a]Applies only to cut-off rooms and attached buildings.

[b]These height limitations can be increased to 10 ft for containers of 5 gal capacity or less.

Table A.16.1.1(b) Storage Arrangements for Protected Rack Storage of Liquids in Containers and Portable Tanks

Liquid Class	Type Rack	Storage Level	Maximum Storage Height of Containers (ft)	Maximum Quantity of Containers (gal)[a,b]
IA	Double row	Ground floor	25	7,500
	or	Upper floors	15	4,500
	single row	Basement	NP	—
IB	Double row	Ground floor	25	15,000
IC	or	Upper floors	15	9,000
	single row	Basement	NP	—
II	Double row	Ground floor	25	24,000
	or	Upper floors	25	24,000
	single row	Basement	15	9,000
III	Multirow,	Ground floor	40	55,000
	double row,	Upper floors	20	55,000
	or single row	Basement	20	25,000

Table A.16.1.1(b) Storage Arrangements for Protected Rack Storage of Liquids in Containers and Portable Tanks

Liquid Class	Type Rack	Storage Level	Maximum Storage Height of Containers (ft)	Maximum Quantity of Containers (gal)[a,b]

For SI units, 1 ft = 0.3 m; 1 gal = 3.8 L.
NP: Not permitted.
[a]Maximum quantity allowed on racks in cut-off rooms and attached buildings.
[b]Maximum quantity allowed per rack section in liquid warehouses.

A.16.1.2 To date, there has been no full-scale testing to determine appropriate fire protection design criteria for Class IA liquids or unstable liquids.

A.16.2.3 Table A.16.2.3 provides examples of commonly used metal containers that are considered either relieving style or nonrelieving style for use in developing protected storage arrangements in accordance with Table 16.5.2.1 through Table 16.5.2.12.

Table A.16.2.3 Common Relieving- and Nonrelieving-Style Metal Containers

Container Type	Relieving Style	Nonrelieving Style
≤1 qt[1]	All	N/A
>1 qt and ≤6 gal[1]	Metal containers with plastic cap, or flexible or rigid plastic spout with plastic cap	Metal containers with steel spout and steel screw cap
≤1 gal, friction lid	Metal containers with metal friction-fit covers (e.g., paint can lid)	N/A
1 gal and ≤6 gal (lug cover)	Metal containers with metal covers held in place with a mechanical friction-fit (e.g., lug-type) closure mechanism	N/A
>6 gal and ≤60 gal[2,3] (drums)	Metal containers, tight or open-head (drums) having at least one 2 in. plastic plug (Note: cap seals, if used, need to be plastic and nonmetallic)	Open head metal containers with steel covers having no steel flange openings; or open head and tight head metal containers with steel flange openings where only steel plugs and/or cap seals are used
>60 gal and ≤793 gal	Metal portable tanks or metal intermediate bulk containers with at least one relief device conforming to the design, construction, and capacity of the container's section	N/A

Table A.16.2.3 Common Relieving- and Nonrelieving-Style Metal Containers

Container Type	Relieving Style	Nonrelieving Style

For SI units, 1 gal = 3.8 L.
N/A: Not applicable.
[1]All containers ≤1 qt are considered relieving style because their failure is inconsequential.
[2]In full-scale fire tests, where containers were provided with both ¾ in. (19 mm) and 2 in. (50 mm) relieving vent openings and, in some cases, both vents were obstructed by pallet slats, rupture of containers did not occur. Because it is not possible to determine if all conceivable obstruction scenarios were represented, where drums are stacked more than one high, provide an additional ¾ in. (19 mm) or 2 in. (50 mm) pressure-relieving mechanism.
[3]The use of plastic plugs instead of steel plugs (bungs) in a steel drum in order to achieve a relieving-style container should contemplate the following issues in order to assure the safe storage of liquids:
(1) The compatibility of the plastic plug materials and gaskets with the liquids being stored.
(2) The stability and shelf life of the liquids being stored as the plastic plugs can admit water vapor, oxygen, and light.
(3) The difference in expansion coefficients for plastic plugs and steel drums for those drums subject to temperature variations and hot or cold conditions.
(4) The tooling issues involved with the use of plastic plugs as the torque levels are different from those levels used for steel plugs.
(5) The training of fill line operators in order to avoid cross-threading and/or the stripping of threads.
(6) The voiding of the United Nations (UN) rating on the steel drum by installing plastic plugs. If the user needs to install a plug other than the one originally provided by the container manufacturer, then the user should contact the manufacturer to ensure that the UN rating will still be valid.

A.16.2.4 Unsaturated polyester resins (UPRs) are high molecular weight unsaturated polymers dissolved in a reactive monomer, usually styrene, in concentrations of 50 percent or less by weight. UPRs are combined with reinforcements such as fiberglass and/or fillers to produce a wide range of products. Examples of such products include automobile parts, bathroom tubs and shower stalls, cultured marble, and many products for architectural, recreational, construction, and corrosion-resistant applications. UPRs are normally packaged in 55 gal (208 L) drums. The U.S. Department of Transportation classification for UPRs is “UN 1866, Resin Solution”; however, it should be noted that this classification includes many materials that are not unsaturated polyester resins.

A.16.5.1.6.2 Most fire tests using foam-water protection schemes have been conducted with immediate foam solution discharge from the operating sprinklers. If an appreciable delay is encountered before properly proportioned foam is discharged, control of the fire might not be established. One method of accomplishing immediate foam solution discharge is by using an in-line balanced pressure (ILBP) proportioning system.

A.16.8.2 Section 16.8 requires that control of liquid spread be provided to prevent a pool fire on the floor from spreading and opening more sprinkler heads than the design of the sprinkler system anticipates. For example, if the sprinkler system is designed to provide 0.45 gpm/ft^2 over 3000 ft^2 (18 mm/min over 280 m^2), 16.8.2 requires that the spread of liquid also be limited to 3000 ft^2 (280 m^2). Various means are available to achieve this control.

Typical methods use trench or spot drains that divide the floor of the storage area into rectangles having areas equal to or less than the design area of the sprinkler system. Drains are centered under racks, and the floor is sloped toward the drain trenches with a minimum slope of 1 percent. The floor is made highest at the walls. See Figure A.16.8.2(a) and Figure A.16.8.2(b). Trenches are arranged as described in NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, and as shown in Figure A.16.8.2(c). Note particularly the dimensions of the trenches, and note that the solid covering spans one-third of the width on either side of the open grate and the open grate spans the middle third. Spot drains can be similarly arranged. Another method, shown in Figure A.16.8.2(d), uses spot drains located at building columns, where the area between any four columns does not exceed the design area of the sprinkler system. The floor is sloped to direct water flow to the drains.

Connections to the drains are provided at trapped sumps, arranged as described in NFPA 15. See Figure A.16.8.2(e). To provide a safety factor, the drain pipes are sometimes sized to carry 150 percent of anticipated sprinkler discharge. The following equation can be used to calculate the flow of the drain pipe:

$$F = 1.5DA$$

where:

F = flow (gpm or L/min)

D = sprinkler design density (gpm/ft^2 or L/min/m^2)

A = sprinkler design area (ft^2 or m^2)

Additional information can be found in *Guidelines for Safe Warehousing of Chemicals*, Center for Chemical Process Safety, American Institute of Chemical Engineers.

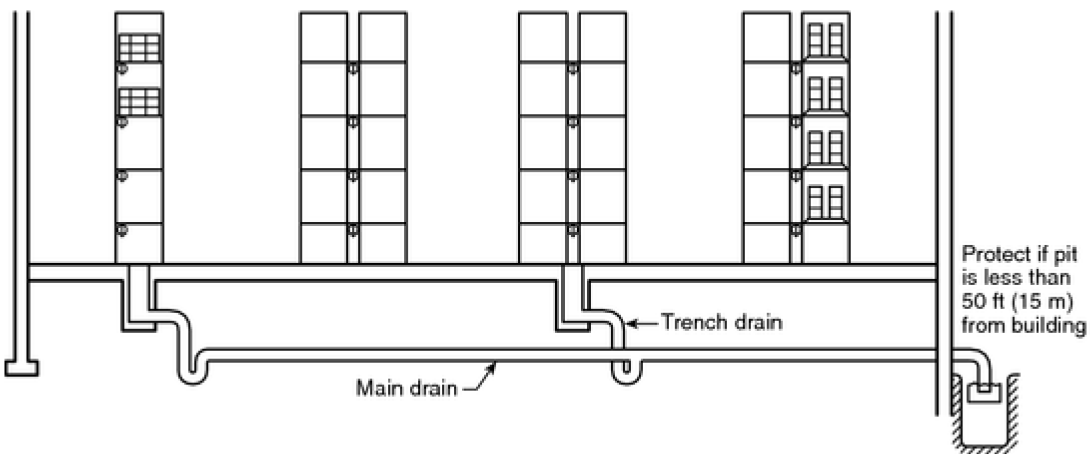


FIGURE A.16.8.2(a) General Scheme for Warehouse Spill Control of Liquids.

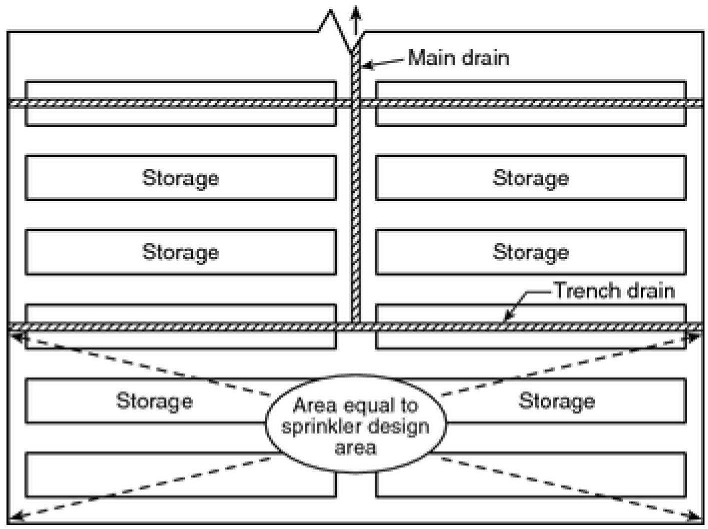


FIGURE A.16.8.2(b) Plan View of Warehouse Spill Control of Liquids.

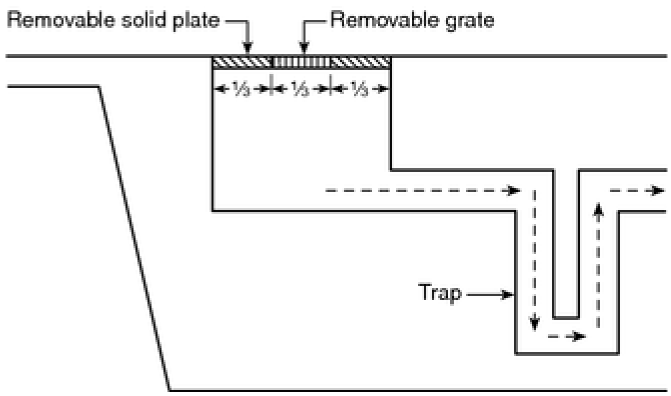


FIGURE A.16.8.2(c) Details of Drainage Trench Design.

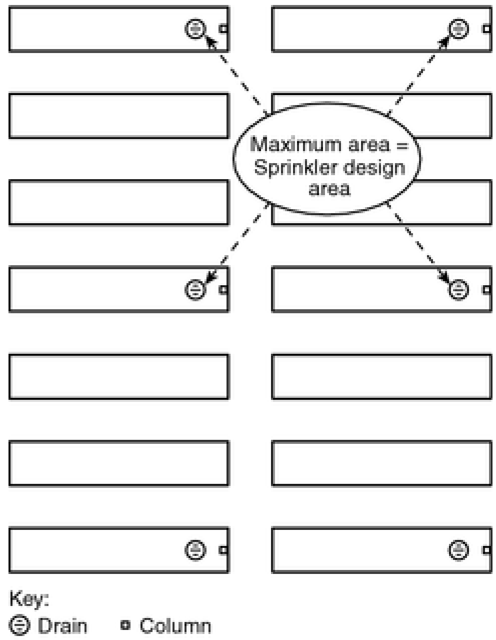


FIGURE A.16.8.2(d) Typical Arrangement of Floor Drains.

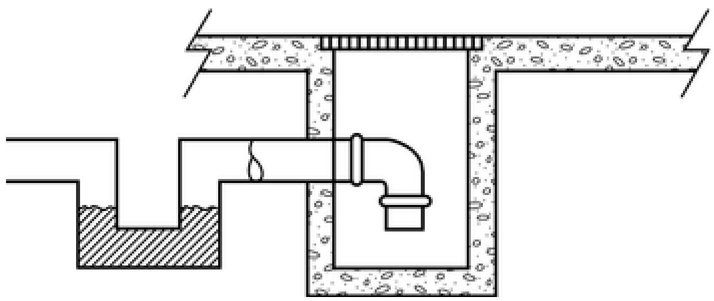


FIGURE A.16.8.2(e) Details of Liquid-Seal Trap.

A.17.1.1 Facilities designed in accordance with Chapter 17 do not use the maximum allowable quantity and control area concepts found in the building code.

A.17.4.6 Equipment operated at gauge pressures that exceed 1000 psi (6900 kPa) might require greater spacing.

A.17.6.8 API 2218, *Fireproofing Practices in Petroleum and Petrochemical Processing Plants*, contains guidance on selecting and installing fire-resistant coatings to protect exposed steel supports from a high-challenge fire exposure. It also contains a general discussion on determining need for such protection and estimating the extent of the area exposed.

A.17.6.10 NFPA 204, *Standard for Smoke and Heat Venting*, provides information on this subject.

A.17.6.11 NFPA *101*, *Life Safety Code*, provides information on this subject.

A.17.10.1 This might require curbs, scuppers, or special drainage systems to control the spread of fire. Annex A of

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, provides information on this subject.

A.17.11.2 Equipment in enclosed processing areas can deteriorate over time, and periodic evaluation should be conducted to ensure that leakage rates have not increased or that the ventilation rate is adequate for any increase in leakage rates.

A.17.11.7 NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*, and NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, provide information on this subject.

A.17.14 Where the vapor space of equipment is usually within the flammable range, the probability of explosion damage to the equipment can be limited by inerting, by providing an explosion suppression system, or by designing the equipment to contain the peak explosion pressure that can be modified by explosion relief. Where the special hazards of operation, sources of ignition, or exposures indicate a need, consideration should be given to providing protection by one or more of the above means.

See NFPA 68, *Standard on Explosion Protection by Deflagration Venting*, and NFPA 69, *Standard on Explosion Prevention Systems*, for additional information on various methods of mitigating losses from explosions.

A.18.3.8 The process area is not intended to be a storage area for liquid containers. However, it is recognized that containers will be brought into the process area either for transfer of liquids to the process or for dispensing liquids from the process to the containers.

The amount of liquid in containers in the process area should be limited as much as possible. Full containers should not be stored in the process area but can be staged there. Only the amount of liquid needed for one continuous 24-hour period should be brought into the process area in full containers. Partial containers can remain in the process area as long as they do not increase the hazard present. Containers that were filled in the process area can remain there during the shift that they were filled but should be relocated to the appropriate storage area before the end of the workday or shift in the case of 24-hour-a-day operations.

A.18.4.1 Incidental operations are operations that utilize liquids only as a limited activity to that which establishes the occupancy classification. Examples include automobile assembly, assembly of electronic equipment, furniture manufacturing, and areas within refineries, distilleries, and chemical plants where the use of liquids is incidental, such as in maintenance shops, offices, or vehicle repair shops. Some more detailed descriptions follow:

(1) *Vehicle Assembly.* Vehicle assembly operations usually involve both process and incidental use of liquids. An example of a process operation would be paint storage and mixing utilized for application of the vehicle primer, color coats, and clear coats. For these operations, the requirements of Chapter 17 apply. Examples of incidental use would be sealer deck wipedown operations, windshield washer solvent dispensing, brake fluid filling, and final line paint repair operations. These operations might be continuous. However, the quantities of liquids used and the vapor exposures are significantly reduced from larger volume usage found within vehicle body component paint mixing and storage operations.

(2) *Assembly of Electrical Equipment.* Examples of incidental use of liquids in these types of occupancies might include “photoresist” coating operations, “softbaking” operations, wave solder operations, and wipedown operations.

(3) *Chemical Plant Maintenance Shop.* Incidental use of liquids is commonplace in maintenance shops located

within a chemical plant. Examples are cutting oils used in a machine shop, Class II solvents for degreasing, and Class I and II paint solvents and fuels associated with automotive and industrial truck repair.

(4) *Cleaning and Sanitation.* Under provisions established by the U.S. Food and Drug Administration (FDA) in 21 CFR, "GMP for Medical Devices," Class I and Class II liquids can be used for cleaning and sanitation purposes. Limited quantities are used to remove manufacturing materials, mold release compounds, and other contaminants not intended to be on the final product. An example would be the use of isopropyl alcohol (IPA), transferred to a cleaning wipe via a plunger-type liquid-dispensing container. The cleaning wipe is then used to remove manufacturing materials not intended to be on the final product. The key point here is not that the liquid is not part of the final product, but that limited quantities of liquid are used and the use is incidental to the manufacturing operation that produces the product.

A.18.4.4.1(1) The intent of this requirement is to allow the quantities of flammable and combustible liquids needed to safely and efficiently operate for the actual operating hours in any 24-hour period. As an example, if the facility operates only 8 hours out of 24 (i.e., a single shift) and uses 50 gal (190 L) of liquid during that time, then 50 gal (190 L) is the allowable quantity for the continuous 24-hour period. If the facility increases operations to two shifts, then the allowable quantity doubles to 100 gal (380 L).

A.18.4.6(3) NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*, provides information on the design and installation of mechanical ventilation.

A.19.4.2 Mist explosions have occurred when heat transfer fluid that is above its boiling point has been released in an enclosed area. Consideration should be given to locating heaters or vaporizers either in a detached building or in a room with damage-limiting construction.

A.19.4.3 The system should be interlocked to stop circulation of the heat transfer fluid through the system and to shut off the system heater or vaporizer in the event of a fire, abnormally low pressure in the system, or operation of an approved heat detection system. Where the refractory inside the heater or vaporizer can retain enough heat to cause either breakdown of the heat transfer fluid or tube fouling if fluid circulation through the unit is stopped, circulation could have to be continued. In the event of a confirmed fire, it is desirable to subdivide the piping system by means of interlocked safety shutoff valves. A practical way of accomplishing this is to isolate all secondary circulating loops from the primary loop that runs into and out of the vaporizer or heater.

A well-marked remote emergency shutoff switch or electrical disconnect should be provided to shut down the entire system in the event of an emergency. This should be located either in a constantly attended location or at a location that would be accessible in the event of a leak or a fire.

If there are any process or utility lines running in or through rooms or areas containing parts of the heat transfer system, consideration should be given to providing emergency shutoff valves. They should be located so they are readily accessible in the event of a fire.

Where the liquid level in the system expansion tank is maintained by an automatically actuated supply pump taking suction from the heat transfer fluid storage tank, an interlock should be provided to shut down the supply pump when a high level indicator is actuated, regardless of whether the pump is in automatic or manual mode.

A.19.4.3.1 Heat transfer fluid systems have the potential for releasing large quantities of heated flammable or combustible liquid. Low point drains piped to a safe location provide the ability to remove heat transfer fluid from a breached piping system in order to minimize the total quantity of fluid released. An engineering analysis should be used to determine the location and design of low point drains. The engineering analysis should consider system inventory, the amount of heat transfer fluid that can be released in a specific fire area, the exposure created by a release, and the fire protection provided.

A.19.4.3.2 Where possible, the drain tank(s) should be located below the lowest system drain opening to permit gravity flow. Breather vents should be provided based on the maximum emptying or filling rates.

A.19.4.4 If stack gas from a heater or vaporizer is recovered to provide auxiliary heat for other equipment (e.g., rotary dryers), suitable dampers, isolation gates, burner control logic, or other means should be provided to ensure that all equipment is properly purged and will operate in a safe manner. The control logic should anticipate all possible operating modes of the individual pieces of equipment, whether operating singly or together, to ensure safe startup and shutdown under normal or upset conditions.

Instrumentation and interlocks should be provided to sound an alarm and to automatically shut down the fuel source to the heater or vaporizer when any of the following conditions are detected:

(1) Low flow of heat transfer fluid through the heat exchange tubes of the heater, as measured at the discharge.

(2) High temperature or pressure of the fluid at the heater or vaporizer outlet. The high-temperature interlock should be set at or below the manufacturer's maximum recommended bulk fluid temperature.

(3) Low pressure at the heater or vaporizer outlet or elsewhere in the system. This interlock could require a bypass to allow for startup.

(4) Low fluid level in the expansion tank.

(5) Low liquid level in the vaporizer.

(6) Sprinkler system flow in any area containing the heat transfer equipment or piping.

Alarm set points should be provided at levels below or above the automatic shutoff setpoints to monitor the above-mentioned variables and provide an opportunity for operators to correct the problem before conditions reach an unsafe level.

A.19.4.5.1 Where possible, piping should be run underground, outside, or in floor trenches. Overhead routing of heat transfer fluid piping should be minimized.

A.19.4.6.1 Historical records show that fires involving heat transfer fluids can be very severe and long lasting. It is recommended that automatic sprinkler or deluge protection be provided throughout all building areas potentially exposed to a heat transfer fluid spill fire.

A.19.4.7.1 Some factors that should be considered as part of such a review include the following:

(1) Infiltration of material being heated into the heat transfer system. In this case, the system should be shut down and the internal leak point found and repaired as soon as possible.

(2) Leaks in the system. Any leak should be corrected promptly regardless of how small. Corrections should be permanent, such as repacking valve stems and replacing leaky gaskets. Any heat transfer fluid released as a result of a leak or operation of a safety valve should be cleaned up immediately if it is or can come in contact

with a hot surface. Other spills can be cleaned up at the first available opportunity.

(3) Pipe or equipment insulation that is soaked with heat transfer fluid. In this case, the cause of the leak should be corrected promptly and the insulation replaced with clean, dry insulation.

(4) High temperature anywhere in the system. In this case, operating procedures should specify shutdown of the heater or vaporizer fuel supply as soon as the temperature of the heat transfer fluid exceeds the manufacturer's recommended maximum bulk fluid temperature. Any corrective actions taken to correct a high temperature condition should only be done with the heat source shut off.

A.19.5.5.1 If the liquid knock-out vessel utilizes a pump for automatic liquid removal, consideration should be given to a low-level alarm and shutdown to avoid running the pump dry, resulting in a potential source of ignition.

A.19.5.7.2 Electrical enclosures that need to be opened frequently for maintenance (i.e., enclosures housing vapor processing system controls) have a higher potential for mechanical damage that could render the enclosures unable to contain an explosion. Additional inspection could be needed to ensure the integrity of the enclosure.

A.19.5.7.3 NFPA 77, *Recommended Practice on Static Electricity*, and API 2003, *Protection Against Ignition Arising Out of Static, Lightning, and Stray Currents*, can be used as a reference for protections against static ignition.

A.19.5.7.4 Spontaneous ignition can be a problem in the following:

(1) Facilities where pyrophoric deposits can accumulate from the handling of oxygen-deficient vapors containing sulfur compounds or asphaltic materials. When air is introduced into the system, the pyrophoric materials can react, resulting in potential ignition and fire.

(2) Facilities that handle fluids in such a way that mixing of hypergolic or otherwise incompatible materials can occur. Such mixing could occur with fluids remaining in the vapor recovery system from prior loading activities.

(3) Facilities handling oxygenated hydrocarbons in carbon absorption units. Higher heats of absorption for these types of vapors can potentially lead to overheated carbon beds and increase the chance that an oxidation reaction can be initiated. (For further information, refer to API Report, "An Engineering Analysis of the Effects of Oxygenated Fuels on Marketing Vapor Recovery Equipment.")

A.19.5.7.5 U.S. Coast Guard Regulations in Title 33, Code of Federal Regulations, Part 154, Section 154.826(b), (c), and (d), can be used as a reference for vapor mover designs that minimize the potential for ignition.

A.19.5.7.6 The potential for ignition in the vapor collection system needs to be evaluated on a case-by-case basis. If ignition occurs, flame propagation in piping systems containing vapor mixtures in the flammable range normally starts with low-speed burning (deflagration). As the flame moves through the piping, it accelerates and, within a short distance, can reach supersonic speeds (detonation). Initial low-speed flame propagation can be stopped by flame arresters, liquid seals, or automatic fast-acting valve systems where designed, operated, and tested within the requirements of NFPA 69, *Standard on Explosion Prevention Systems*. Flame propagation can also be stopped for both deflagrations and detonations by use of detonation arresters tested in accordance with U.S. Department of Transportation Coast Guard Regulations of the 33 CFR 154, Appendix A, or other procedures acceptable to the authority having jurisdiction, or automatic fast-acting valve systems tested under the appropriate conditions.

A.21.4.2.1.1 Atmospheric tanks include tanks of compartmented design and tanks that incorporate secondary containment.

A.21.4.2.3.2 Such pressure vessels are generally referred to as “state special.”

A.21.4.3.9 Liquid properties that justify omitting such devices include, but are not limited to, condensation, corrosiveness, crystallization, polymerization, freezing, or plugging. When any of these conditions exist, consideration should be given to heating, use of devices that employ special materials of construction, use of liquid seals, or inerting. See NFPA 69, *Standard on Explosion Prevention Systems*.

A.21.4.4 **Exception No. 2.** Examples of liquids with minimal potential for accumulation of static charge include crude oil, asphalt, and water-miscible liquids. For additional information, see NFPA 77, *Recommended Practice on Static Electricity*.

A.21.4.5 Other means of internal corrosion protection include protective coatings and linings and cathodic protection.

A.21.5.2 See PEI RP200, *Recommended Practices for Installation of Aboveground Storage Systems for Motor Vehicle Fueling*, and STI R931, *Double Wall AST Installation and Testing Instructions*, for additional requirements to test secondary containment tanks.

A.21.5.2.6 Underground double-wall tanks can be considered to be a type of secondary containment. The terms “double-wall tank” and “jacketed tank” are sometimes used to describe underground secondary containment tanks.

A.21.5.3 For information on testing of underground tanks, see NFPA 329, *Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases*. For information on testing aboveground tanks, see API 653, *Tank Inspection, Repair, Alteration, and Reconstruction*.

A.21.6.6.1 See NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, or other specific fire protection system standards.

A.21.7.1 Further guidance is given in API 2350, *Overfill Protection for Storage Tanks in Petroleum Facilities*.

A.21.7.4.1 For further information, see API 2015, *Cleaning Petroleum Storage Tanks*; API 2015A, *A Guide for Controlling the Lead Hazard Associated with Tank Entry and Cleaning*; and API 2015B, *Cleaning Open Top and Covered Floating Roof Tanks.*

A.21.7.4.3.3(2) Special training might be required.

A.21.7.5 See NFPA 329, *Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases*, for information on testing methods.

A.21.8.1 Regular inspections of aboveground storage tanks, including shop fabricated aboveground storage tanks, performed in accordance with national standards, provide a means to ensure system maintenance. Acceptable standards include, but are not limited to, the following:

(1) API 653, *Tank Inspection, Repair, Alteration, and Reconstruction*

(2) STI SP001, *Standard for Inspection of Aboveground Storage Tanks*

(3) API 12R1, *Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Production Service*

(4) API 2350, *Overfill Protection for Storage Tanks in Petroleum Facilities*

A.21.8.6 For additional information, see API 653, *Tank Inspection, Repair, Alteration, and Reconstruction*.

A.21.8.8 The accumulation of water in the bottom of a tank encourages microbial activity that hampers operations and increases the risk of product release. It is imperative that tank owners and operators routinely monitor the tank bottom for accumulation of water and establish a procedure for when and how the water is to be removed. Additional information can be found in API 1501, *Filtration and Dehydration of Aviation Fuels*, API RP 1621, *Bulk Liquid Stock Control at Retail Outlets*, and API Standard 2610, *Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities*. Other sources of information are ASTM D 6469, *Standard Guide for Microbial Contamination in Fuels and Fuel Systems*, the National Oilheat Research Alliance *Oilheat Technician's Manual*, and the STI publication *Keeping Water Out of Your Storage System*.

A.22.4 See PEI RP200, *Recommended Practices for Installation of Aboveground Storage Systems for Motor Vehicle Fueling*, for additional information.

A.22.5.2.1 Appendix E of API Standard 650, *Welded Steel Tanks for Oil Storage*, and Appendix B of API 620, *Recommended Rules for the Design and Construction of Large, Welded, Low-Pressure Storage Tanks*, provide information on tank foundations.

A.22.5.2.4 For further information, see ASTM E 119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, and UL 1709, *Standard for Rapid Rise Fire Tests of Protection Materials for Structural Steel*.

A.22.7.3.1 An engineering evaluation should be performed whenever two-phase flow is anticipated. The objective of the engineering evaluation determining emergency vent requirements and design of the relief system is to protect against catastrophic failure resulting in unacceptable risk to persons or to the facility. Factors that should be included in the evaluation are as follows:

(1) Properties of the materials including evaluated influence of two-phase flow and thermally induced instability. See the following references from the Design Institute for Emergency Relief Systems of the Center for Chemical Process Safety/American Institute of Chemical Engineers:

  (a) Fisher, H. G. and Forrest, H. S., "Protection of Storage Tanks from Two-Phase Flow Due to Fire Exposure"

  (b) Houser, J., et al, "Vent Sizing for Fire Considerations: External Fire Duration, Jacketed Vessels, and Heat Flux Variations Owing to Fuel Consumption"

  (c) *Guidelines for Pressure Relief and Effluent Handling Systems*

(2) Rate of heat input to the tank and contents. Computer models such as PLGS (supported by the UK Health and Safety Executive) can be useful in making the analysis.

(3) Fire duration. For pool fires this analysis can be based on burning rate and pool depth. Computer programs can be useful in making this analysis.

A.22.7.3.3 The formula shown in 22.7.3.3 is based on the following:

$$Q = 21{,}000(A)^{0.82}$$

where:

Q = Btu/hr

A = ft^2

A.22.7.3.6 The provisions of 22.7.3.6 and 22.7.3.7 are based on full-scale testing that demonstrated that ethyl alcohol and liquids having similar burning characteristics required less emergency venting capacity.

Ethyl alcohol (ethanol) has a heat of combustion of 11,550 Btu/lb (26.8 mJ/kg) and a rate of burning of 0.000626 lb/ft^2/sec (0.015 kg/m^2/sec). The burning rate was calculated based on pan pool fires of diameters between 0.2 m (0.7 ft) and 5.0 m (16.5 ft). The pool fires were burning at steady state in a wind-free environment. The ratio of the lip height of the pan (freeboard) to the diameter of the pan was approximately 0.06. Details of these tests can be found in "Fire Tests of Distilled Spirit Storage Tanks," Client Report CR-5727.1, for the Association of Canadian Distillers.

A.22.7.3.7 See A.22.7.3.6.

A.22.7.3.10.4 The following is a suitable formula for this calculation:

$$CFH = 1667 C_f A \sqrt{P_t - P_a}$$

where:

CFH = venting requirement (ft^3 of free air per hour)

C_f = flow coefficient of 0.5

A = orifice area (in.^{2})

P_t = absolute pressure inside the tank (in. of water)

P_a = absolute atmospheric pressure outside the tank (in. of water)

A.22.7.4 Vent sizing formulae and prescriptive vent sizes, such as those established by UL 142, *Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids*, are typically based on the direct installation of a venting device on to a tank with a nipple not exceeding 12 in. (300 mm). When the outlet of a vent must be extended to a remote location, such as for tanks located in buildings, which require vent discharges to be located outside, a significant reduction in vent flow can occur unless the size of the vent and connecting piping is increased. In such cases, the size of vents and vent pipe extensions should be calculated to ensure that a tank will not be over-pressurized during a fire exposure.

A.22.8.1 Protection against fire or explosion required for large flammable liquid storage tanks should consider the use of fixed, semi-fixed, or portable protection system designed in conformance with good engineering practice such as those described in NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*, NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, and NFPA 69, *Standard on Explosion Prevention Systems*. Ordinary combustibles (such as wood) would be subject to radiant heat unpiloted ignition from a burning tank, when such exposures are located a distance of less than about 150 percent of the tank diameter (assuming no wind effects). Exposure from adjacent property to the tanks would depend on the specific products and storage arrangement and may require some engineering analysis based on the occupancy and its exposure potential.

A.22.11 "Accidental release" includes but is not limited to the following:

(1) Leakage from the tank shell

(2) Overfill

(3) Leakage from piping connected to the tank

A.22.11.2.2 An aboveground storage tank dike is normally sized to contain the entire contents of the largest single tank within it. Some designs incorporate sufficient freeboard (additional capacity) to accommodate precipitation or fire-fighting water. The amount of this freeboard is usually governed by local conditions.

A.22.11.2.4.1 Diked areas for tanks containing Class I liquids located in extremely porous soils might require special treatment to prevent seepage of hazardous quantities of liquids to low-lying areas or waterways in case of spills.

A.22.11.2.6.3.4 Because unstable liquids will react more rapidly when heated than when at ambient temperatures, subdivision by drainage channels is the preferred method.

A.22.11.3.1 See A.22.11.2.2.

A.22.12.1 **Exception.** As noted in this exception, engineering designs that can reduce exposure hazards include use of sealed sleeve piping and secondary containment piping to prevent leakage and the use of remotely controlled isolation valves on product lines to stop the flow of liquids when the piping is subjected to fire exposure.

A.22.12.3 Methods of preventing an exposure hazard include intermediate diking, drainage, or fire protection features such as water spray systems, monitors, or fire-resistive coatings. High integrity pumps or equipment also constitute a method of limiting exposure hazards.

A.23.3.3 Dropping or rolling the tank into the hole can break a weld, puncture or damage the tank, or scrape off the protective coating of coated tanks. See PEI RP100, *Recommended Practices for Installation of Underground Liquid Storage Systems*.

A.23.3.4(1) Acceptable design standards for cathodic protection systems include the following:

(1) API RP 1632, *Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems*

(2) ULC-S603.1M, *Standard for Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids*

(3) STI-P3, *Specification and Manual for External Corrosion Protection of Underground Steel Storage Tanks*

(4) NACE RP-0169, *Recommended Practice, Control of External Corrosion on Underground or Submerged Metallic Piping Systems*

(5) NACE RP-0285, *Recommended Practice, Corrosion Control of Underground Storage Tank Systems by Cathodic Protection*

(6) UL 1746, *Standard for External Corrosion Protection Systems for Steel Underground Storage Tanks*, Part 1

(7) STI RP 892, *Recommended Practice for Corrosion of Underground Piping Networks Associated with Liquid*

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A.23.3.4(2) See UL 1316, *Standard for Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures*; UL 1746, *Standard for External Corrosion Protection Systems for Steel Underground Storage Tanks;* and STI ACT-100, *Specification for External Corrosion Protection of FRP Composite Steel Underground Tanks*, F894.

A.23.3.4.1 See API RP 1615, *Installation of Underground Petroleum Storage Systems*, for further information.

A.23.5.3.1 Maximum burial depths, measured from the top of the tank, are established by the tank manufacturers and by independent testing laboratories.

A.23.6.1 The required venting capacity depends upon the filling or withdrawal rate, whichever is greater, and the vent line length. Unrestricted vent piping sized in accordance with Table 23.6.2 will prevent back pressure development in tanks from exceeding a gauge pressure of 2.5 psi (17.2 kPa).

A.23.14.2 Anchoring should be done using nonmetallic straps or metallic straps that are separated from the tank shell by inert insulating dielectric material. The straps should be connected to a bottom hold-down pad or deadman anchors. For additional information, see reference to API RP 1615, *Installation of Underground Petroleum Storage Systems*; PEI RP100, *Recommended Practices for Installation of Underground Liquid Storage Systems*; and STI RP R011, *Recommended Practice for Anchoring of Steel Underground Storage Tanks*.

A.24.1 Chapter 24 provides an approach that allows considerable flexibility for compliance without compromising fire safety, while fostering ingenuity in application of fire safety principles to achieve the intended objectives, outlined in the performance criteria set out at the beginning of each subsection. Each subsection has been written with the first sentence outlining the performance criteria that, if implemented, would achieve compliance with that subsection. In order to clarify the intent of each performance criterion, the subsequent paragraphs constitute one method of achieving compliance with the intent envisioned in the performance requirements. It is recognized that other combinations of requirements can also be used to meet the intent of the performance criteria, provided such requirements are acceptable to the authority having jurisdiction.

A.24.4.5(3) See NFPA 68, *Standard on Explosion Protection by Deflagration Venting*, for information on deflagration venting.

A.24.5.2 See NFPA 220, *Standard on Types of Building Construction*.

A.24.5.4 See NFPA 68, *Standard on Explosion Protection by Deflagration Venting*, for information on deflagration venting.

A.24.5.6 NFPA *101*, *Life Safety Code*, provides information on the design of exit facilities.

A.24.6.1.1 NFPA 10, *Standard for Portable Fire Extinguishers*, provides information on the suitability of various types of extinguishers.

A.24.6.1.2 See NFPA 13, *Standard for the Installation of Sprinkler Systems*, and NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*.

A.24.6.2.2 See NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*, for information on this subject.

A.24.6.2.3 See NFPA 13, *Standard for the Installation of Sprinkler Systems*; NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*; and NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*, for information on these subjects.

For certain fuel types, such as ketones, esters, and alcohols, the minimum required densities established in the listing criteria for foam discharge devices are often higher than the general densities specified for protection of flammable and combustible liquids. When determining the design criteria for extinguishing systems using foam, it is important to ensure that the listing criteria, which are typically based on empirical data from fire tests, are not overlooked. Otherwise, the fire protection system design can be inadequate for proper protection.

A.24.9.6 Annex A of NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, provides information on this subject.

A.24.10.2 Equipment in enclosed storage areas can deteriorate over time and periodic evaluation should be conducted to assure that leakage rates have not increased or that the ventilation rate is adequate for any increase in leakage rates.

A.24.10.4 Local or spot ventilation might be needed for the control of special fire or health hazards. NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*, and NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, provide information on this subject.

A.24.14.6 Substitutes for manual gauging include, but are not limited to, heavy-duty flat gauge glasses; magnetic, hydraulic, or hydrostatic remote reading devices; and sealed float gauges.

A.24.14.8 Suitable devices include, but are not limited to, a float valve; a pre-set meter on the fill line; a low head pump incapable of producing overflow; or a liquidtight overflow pipe, sized at least one pipe size larger than the fill pipe, that discharges by gravity back to the outside source of liquid or to an approved location.

A.25.3.1 Inspections are recommended for shop fabricated aboveground tanks. One guide is SP001, *Standard for Inspection of Aboveground Storage Tanks*, which is published by the Steel Tank Institute. In addition, the tank owner may desire to conduct additional inspections to ensure the ongoing integrity of tanks and equipment. Because the interior of a vault will ordinarily remain dry and temperature-moderated, environmental effects on tanks and equipment inside vaults will be reduced as compared to aboveground tanks that are not protected from weather exposure. Accordingly, inspection and maintenance frequencies for exterior surfaces of tanks and piping in vaults are typically less critical than for aboveground tanks installed outdoors. Nevertheless, inspection and maintenance of emergency vents and overfill prevention devices are still necessary.

Clearance between the shell of a tank or equipment in a vault and the interior vault wall should be sufficient to accommodate visual inspections and maintenance that may be needed. In addition, consideration should be given to the need for inspection and maintenance of tank interior surfaces that may be impacted by internal corrosion.

Clearance should be adequate to permit the following:

(1) Entry into the vault interior by an inspector or maintenance worker

(2) Access to manipulate, repair, or replace any equipment or fittings in the vault

(3) Access within the vault to visually inspect, either by direct sight or with the aid of an optical vision extension tools, interior vault surfaces and exterior surfaces of tanks and equipment, to determine the source of any leakage that may occur, and to conduct any needed repairs

Because vaults are designed to provide for entry by inspectors or maintenance workers, consideration should also be given to providing access for rescue by emergency responders who may be called upon to rescue an individual from a vault. Such consideration may include providing a minimum access hatch dimension of 36 in. (915 mm) and a minimum dimension for walkways in vault interior spaces of 30 in. (760 mm) to permit an emergency responder with an SCBA to maneuver and providing, in some cases, a second means of access to the vault interior.

A.25.5 Some of the specifications for vault design and construction include the following:

(1) The walls and floor of the vault are to be constructed of reinforced concrete at least 6 in. (50 mm) thick.

(2) The top and floor of the vault and the tank foundation must be designed to withstand all anticipated loading, including loading from vehicular traffic, where applicable.

(3) The walls and floor of a belowgrade vault must be designed to withstand anticipated soil and hydrostatic loading.

(4) The vault must be liquidtight.

(5) The vault enclosure must have no openings except those necessary for access to, inspection of, and filling, emptying, and venting of the tank.

(6) The vault shall be provided with connections to permit ventilation to dilute, disperse, and remove any vapors prior to personnel entering the vault.

(7) The vault must be provided with a means for personnel entry.

(8) The vault must be provided with an approved means to admit a fire suppression agent.

A.27.4.3.2 For further information, see ASTM E 119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, and UL 1709, *Standard for Rapid Rise Fire Tests of Protection Materials for Structural Steel*.

A.27.5.1.2 It is expected that some joints may leak under fire conditions but will not come apart.

A.27.6.2 API 2218, *Fireproofing Practices in Petroleum and Petrochemical Processing Plants*, contains guidance on selecting and installing fire-resistant coatings to protect exposed steel supports from a high-challenge fire exposure. It also contains a general discussion on determining need for such protection and estimating the extent of the area exposed.

A.27.6.4 Buried steel piping should be coated with a suitable material and should be cathodically protected. Galvanized steel pipe, by itself and without other corrosion protection methods, is not acceptable for underground piping. Steel swing joints and stainless steel flexible connectors should also be made corrosion resistant when in contact with the soil. Thus, such fittings should also be coated and cathodically protected when installed between nonmetallic, compatible tanks and piping, such as fiberglass-reinforced plastic.

A.27.8.1.6 Vent sizing formulae and prescriptive vent sizes, such as those established by UL 142, *Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids*, are typically based on the direct installation of a venting device onto a tank. When the outlet of a vent must be extended to a remote location, such as for tanks located in buildings, which require vent discharges, to be located outside, a significant reduction in vent flow can occur unless the size of the vent and connecting piping is increased. In such cases, the size of vents and vent pipe extensions should be calculated to ensure that a tank will not be over-pressurized during a fire exposure.

A.27.10 Where loading and unloading risers for Class II or Class IIIA liquids are located in the same immediate area as loading and unloading risers for Class I liquids, consideration should be given to providing positive means, such as different pipe sizes, connection devices, special locks, or other methods designed to prevent the erroneous transfer of Class I liquids into or from any container or tank used for Class II or Class IIIA liquids. Note that such consideration might not be necessary for water-miscible liquids, where the class is determined by the concentration of liquid in water, or where the equipment is cleaned between transfers.

A.28.3.1.2 The use of nonconductive materials in the fill pipe assembly should be avoided to prevent any electrical discontinuity in the piping of the system. Serious accidents have occurred when nonconductive materials, such as plastic or rubber hose, have been used in the fill pipe assembly.

A.28.4.2 Use of fixed fire protection systems, dikes, fire-rated barriers, or a combination of any of these can provide suitable protection from exposures.

A.28.9 The intent of this requirement is to prevent the spread of uncontrolled, spilled liquid from traveling beyond the loading or unloading area and exposing surrounding equipment and buildings.

A.28.11.1.5 NFPA 77, *Recommended Practice on Static Electricity*, provides additional information on static electricity protection.

A.28.11.2.2 NFPA 77, *Recommended Practice on Static Electricity*, provides additional information on static electricity protection.

A.28.11.3 The term *switch loading* describes a situation that warrants special consideration.

When a tank is emptied of a cargo of Class I liquid, a mixture of vapor and air is left, which can be, and often is, within the flammable range. When such a tank is refilled with a Class I liquid, any charge that reaches the tank shell will be bled off by the required bond wire. Also, there will be no flammable mixture at the surface of the rising oil level because the Class I liquid produces at its surface a mixture too rich to be ignitible. This is the situation commonly existing in tank vehicles in gasoline service. If, as occasionally happens, a static charge does accumulate on the surface sufficient to produce a spark, it occurs in a too-rich, nonignitible atmosphere and thus causes no harm.

A very different situation arises if the liquid is “switch loaded,” that is, when a Class II or Class III liquid is loaded into a tank vehicle that previously contained a Class I liquid.

Class II or Class III liquids are not necessarily more potent static generators than the Class I liquid previously loaded, but the atmosphere in contact with the rising oil surface is not enriched to bring it out of the flammable range. If circumstances are such that a spark should occur either across the oil surface or from the oil surface to some other object, the spark occurs in a mixture that can be within the flammable range, and an explosion can result.

It is emphasized that bonding the tank to the fill stem is not sufficient; a majority of the recorded explosions have occurred when it was believed the tank had been adequately bonded. The electrostatic potential that is responsible for the spark exists inside the tank on the surface of the liquid and cannot be removed by bonding. Measures to reduce the change of such internal static ignition can be one or more of the following:

(1) Avoid spark promoters. Conductive objects floating on the oil surface increase the charge of sparking to the tank wall. Metal gauge rods or other objects projecting into the vapor space can create a spark gap as the rising liquid level approaches the projection. A common precaution is to require that fill pipes (downspouts) reach as close to the bottom of the tank as practicable. Any operation such as sampling, taking oil temperature, or gauging that involves lowering a conductive object through an opening into the vapor space on the oil should be deferred until at least 1 minute after flow has ceased. This will permit any surface charge to relax.

(2) Reduce the static generation by one or more of the following:

  (a) Avoid splash filling and upward spraying of oil where bottom filling is used.

  (b) Employ reduced fill rates at the start of filling through downspouts, until the end of the spout is submerged. Some consider 3 ft/sec (0.9 m/sec) to be a suitable precaution.

  (c) Where filters are employed, provide relaxation time in the piping downstream from the filters. A relation time of 30 seconds is considered by some to be a suitable precaution.

(3) Eliminate the flammable mixture before switch loadings by gas freeing or inerting.

See NFPA 77, *Recommended Practice on Static Electricity*, and NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids*, for further information.

A.29.3.25 Where practical, the collection basin should be drained to a remote location.

A.29.3.28 Because of the many variables involved, exact requirements cannot be provided. However, Table A.29.3.28 provides guidance on the level of fire protection typically provided at wharves and marine terminals handling flammable liquids.

Table A.29.3.28 Typical Fire Protection for Wharves and Marine Terminals

				Fire Extinguisher Dry Chemical					
Locations	**Water Demand (gpm)**	**Hydrant Monitors[a] (gpm)**	**Hose Reels**	**30 lb**	**150 lb Wheeled**	**International Shore Connection**	**Emergency Equipment Lockers**	**Monitors and Hose Foam Concentrate Required (gal)**	**Fi Co**
Barge terminals	500–1000	Two 500	Two 1¼	2	NR	NR	1	100[b]	
Tankers 20,000 DWT and under	1000–2000	Two 500	Two 1¼	2	1	1	1	300[b]	
20,001–70,000 DWT	2000	Two 1000	Four 1¼[c]	2	2[d]	2	1	2000	
70,001 DWT and over	2000[e]	Two 1000	Four 1¼[c]	3	2[d]	2	1	2000[f]	
Sea islands	2000–4000[e]	Three 1000	Four 1¼[c]	4	2	3	2	3000	

Table A.29.3.28 Typical Fire Protection for Wharves and Marine Terminals

Locations	Water Demand (gpm)	Hydrant Monitors[a] (gpm)	Hose Reels	Fire Extinguisher Dry Chemical 30 lb	Fire Extinguisher Dry Chemical 150 lb Wheeled	International Shore Connection	Emergency Equipment Lockers	Monitors and Hose Foam Concentrate Required (gal)	Fi Co

For SI units, 1 gpm = 3.8 L/min; 1 gal = 3.8 L; 1 lb = 0.45 kg.

NR: Not required.

[a]A minimum of two 1½ in. (38 mm) hydrant outlets should be provided at each monitor riser.

[b]Can be provided by onshore mobile equipment.

[c]One hose reel at each berth should have foam capability.

[d]The proximity of adjacent berths can reduce total required.

[e]Under-dock systems are optional. Add water for under-dock system (0.16 × area).

[f]Under-dock systems are optional. Add foam for under-dock system (0.16 × 0.3 × 30 × area).

Annex B Emergency Relief Venting for Fire Exposure for Aboveground Tanks

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

B.1 General.

The requirements for emergency venting given in Table 22.7.3.2 and the modification factors in 22.7.3.5 are derived from a consideration of the following:

(1) Probable maximum rate of heat transfer per unit area

(2) Size of tank and the percentage of total area likely to be exposed

(3) Time required to bring tank contents to boil

(4) Time required to heat unwet portions of the tank shell or roof to a temperature where the metal will lose strength

(5) Effect of drainage, insulation, and the application of water in reducing fire exposure and heat transfer

B.2 Derivation of Table 22.7.3.2.

Table 22.7.3.2 is based on a composite curve *(see Figure B.2)* that is composed of three straight lines when plotted on log–log graph paper. The curve can be defined in the following manner:

(1) The first straight line is drawn between the points 400,000 Btu/hr at 20 ft^2 (1.86 m^2) exposed surface area, and 4,000,000 Btu/hr at 200 ft^2 (18.6 m^2) exposed surface area. The equation for this portion of the curve is the following:

$$Q = 20{,}000A$$

where:

Q = Btu/hr

A = exposed shell area (ft^2)

(2) The second straight line is drawn between the points 4,000,000 Btu/hr at 200 ft^2 (18.6 m^2) exposed surface area, and 9,950,000 Btu/hr at 1000 ft^2 (93 m^2) exposed surface area. The equation for this portion of the curve is the following:

$$Q = 199{,}300(A)^{0.566}$$

where:

Q = Btu/hr

A = exposed shell area (ft^2)

(3) The third straight line is drawn between the points 9,950,000 Btu/hr at 1000 ft^2 (93 m^2) exposed surface area, and 14,090,000 Btu/hr at 2800 ft^2 (260 m^2) exposed surface area. The equation for this portion of the curve is the following:

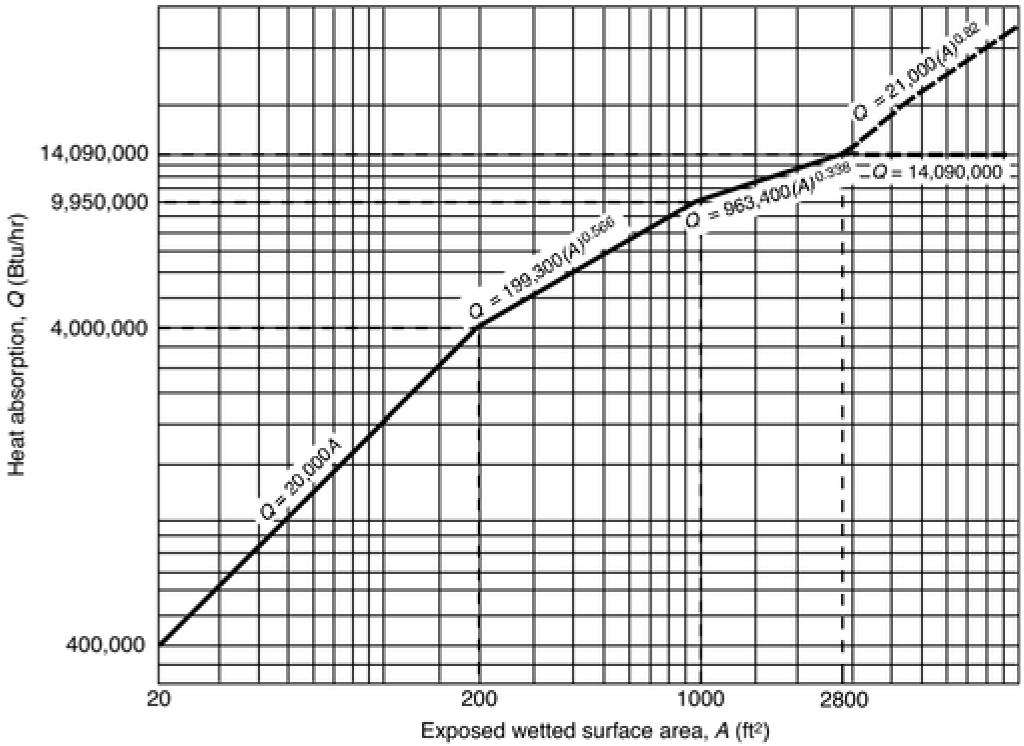
$$Q = 963{,}400(A)^{0.338}$$

where:

Q = Btu/hr

A = exposed shell area (ft^2)

The data for plotting the three lines are given in Table B.2.



Notes: (1) For SI units, 1 ft² = 0.09 m².
(2) See Table B.4 for approximate wetted area for horizontal tanks.

FIGURE B.2 Curve for Determining Requirements for Emergency Venting During Fire Exposure.

Table B.2 Data for Figure B.2

$Q = 20{,}000A$		$Q = 199{,}300(A)^{0.566}$		$Q = 963{,}400(A)^{0.338}$	
A	***Q***	***A***	***Q***	***A***	***Q***
20	400,000	200	4,000,000	1000	10,000,000
30	600,000	250	4,539,000	1200	10,593,000
40	800,000	300	5,032,000	1400	11,122,000
50	1,000,000	350	5,491,000	1600	11,601,000
60	1,200,000	400	5,922,000	1800	12,040,000
70	1,400,000	500	6,719,000	2000	12,449,000
80	1,600,000	600	7,450,000	2400	13,188,000
90	1,800,000	700	8,129,000	2800	14,000,000
100	2,000,000	800	8,768,000	and over	
120	2,400,000	900	9,372,000		
140	2,800,000	1000	10,000,000		
160	3,200,000				
180	3,600,000				
200	4,000,000				

For SI units, 1 ft^2 = 0.093 m^2; 1 Btu/hr = 02.93 × 10^{-4} kW.

B.2.1 For areas exceeding 2800 ft^2 (260 m^2), it has been concluded that complete fire involvement is unlikely, and loss of metal strength from overheating will cause failure in the vapor space before development of maximum possible vapor evolution rate. Therefore, additional venting capacity beyond the vapor equivalent of 14,000,000 Btu/hr (4100 kW) shown in Table B.2 will not be effective or required.

B.2.2 For tanks and storage vessels designed for pressures over a gauge pressure of 1.0 psi (6.9 kPa), additional venting for exposed surfaces beyond 2800 ft^2 (260 m^2) is believed to be desirable because, under these storage conditions, liquids are stored close to their boiling points. Therefore, the time to bring the container contents to boiling conditions is not necessarily significant. For these situations, a heat input value should be determined on the basis of the following equation:

$$Q = 21{,}000(A)^{0.82}$$

where:

Q = Btu/hr
A = exposed shell area (ft^2)

B.3 Estimation of Emergency Relief Venting for Specific Liquids.

The flow capacities estimated in Section B.2 are based on the assumption that the stored liquid will have the characteristics of hexane and the vapor liberated has been transposed to equivalent free air at 60°F (15.6°C) and an absolute pressure of 14.7 psi (101.3 kPa) by using appropriate factors in the following:

$$CFH = \frac{70.5Q}{L\sqrt{M}}$$

where:

CFH = cubic feet of free air per hour
70.5 = factor for converting pounds of gas to ft^3 of air
Q = total heat input per hour (Btu)
L = latent heat of vaporization (Btu/lb)
M = molecular weight

No consideration has been given to possible expansion from the heating of the vapor above the boiling point of the liquid, its specific heat, or the difference in density between the discharge temperature and 60°F (15.6°C), because some of these changes are compensating.

Because tank vent valves are ordinarily rated in CFH standard air, the figures derived from Table 22.7.3.2 can be used with the appropriate tank pressure as a basis for valve selection.

Table B.3 gives constants that can be used to compute the vapor generated and equivalent free air for liquids other than hexane, where greater exactness is desired. Inspections of the table will show that the use of hexane in deriving

Table 22.7.3.2 provides results that are within an acceptable degree of accuracy for the listed liquids.

Table B.3 Values of L√M for Various Liquids

Chemical	*L*√M	Molecular Weight	Heat of Vaporization (Btu/lb) at Boiling Point
Acetaldehyde	1673	44.05	252
Acetic acid	1350	60.05	174
Acetic anhydride	1792	102.09	177
Acetone	1708	58.08	224
Acetonitrile	2000	41.05	312
Acrylonitrile	1930	53.06	265
n-Amyl alcohol	2025	88.15	216
iso-Amyl alcohol	1990	88.15	212
Aniline	1795	93.12	186
Benzene	1493	78.11	169
n-Butyl acetate	1432	116.16	133
n-Butyl alcohol	2185	74.12	254
iso-Butyl alcohol	2135	74.12	248
Carbon disulfide	1310	76.14	150
Chlorobenzene	1422	112.56	134
Cyclohexane	1414	84.16	154
Cyclohexanol	1953	100.16	195
Cyclohexanone	1625	98.14	164
o-Dichlorobenzene	1455	147.01	120
cis-Dichloroethylene	1350	96.95	137
Diethylamine	1403	73.14	164
Dimethylacetamide	1997	87.12	214
Dimethylamine	1676	45.08	250
Dimethylformamide	2120	73.09	248
Dioxane (diethylene ether)	1665	88.10	177
Ethyl acetate	1477	88.10	157
Ethyl alcohol	2500	46.07	368
Ethyl chloride	1340	64.52	167
Ethylene dichloride	1363	98.96	137
Ethyl ether	1310	74.12	152
Furan	1362	68.07	165
Furfural	1962	96.08	200
Gasoline	1370–1470	96.0	140–150
n-Heptane	1383	100.20	138
n-Hexane	1337	86.17	144
Hydrogen cyanide	2290	27.03	430
Methyl alcohol	2680	32.04	474
Methyl ethyl ketone	1623	72.10	191
Methyl methacrylate	1432	100.14	143

Table B.3 Values of $L\sqrt{M}$ for Various Liquids

Chemical	$L\sqrt{M}$	Molecular Weight	Heat of Vaporization (Btu/lb) at Boiling Point
n-Octane	1412	114.22	132
n-Pentane	1300	72.15	153
n-Propyl acetate	1468	102.13	145
n-Propyl alcohol	2295	60.09	296
iso-Propyl alcohol	2225	60.09	287
Tetrahydrofuran	1428	72.10	168
Toluene	1500	92.13	156
Vinyl acetate	1532	86.09	165
o-Xylene	1538	106.16	149

For SI units, 1 Btu/lb = 2.3 kJ/kg.

Note: For data on other chemicals, refer to available handbooks on properties of chemicals.

B.4 Estimation of Wetted Area for Horizontal Tanks.

Table B.4 gives the approximate wetted area for various sizes and configurations of horizontal tanks with flat heads, based on 75 percent of total shell area.

Table B.4 Approximate Wetted Areas for Horizontal Tanks with Flat Heads

Tank Length (ft)	Tank Diameter (ft)									
	3	4	5	6	7	8	9	10	11	12
3	32	—	—	—	—	—	—	—	—	—
4	39	55	—	—	—	—	—	—	—	—
5	46	65	88	—	—	—	—	—	—	—
6	53	74	100	128	—	—	—	—	—	—
7	60	84	112	142	173	—	—	—	—	—
8	67	93	124	156	190	226	—	—	—	—
9	74	102	136	170	206	245	286	—	—	—
10	81	112	147	184	223	264	308	353	—	—
11	88	121	159	198	239	283	329	377	428	—
12	95	131	171	213	256	301	350	400	454	509
13	102	140	183	227	272	320	371	424	480	537
14	109	150	194	241	289	339	393	447	506	565
15	116	159	206	255	305	358	414	471	532	594
16	123	169	218	269	322	377	435	495	558	622
17	130	178	230	283	338	395	456	518	584	650
18	137	188	242	298	355	414	477	542	610	678
19	—	197	253	312	371	433	499	565	636	707
20	—	206	265	326	388	452	520	589	662	735

Table B.4 Approximate Wetted Areas for Horizontal Tanks with Flat Heads

Tank Length (ft)	Tank Diameter (ft)									
	3	4	5	6	7	8	9	10	11	12
21	—	216	277	340	404	471	541	612	688	763
22	—	225	289	354	421	490	562	636	714	792
23	—	235	300	368	437	508	584	659	740	820
24	—	244	312	383	454	527	605	683	765	848
25	—	—	324	397	470	546	626	706	791	876
26	—	—	336	411	487	565	647	730	817	905
27	—	—	347	425	503	584	668	754	843	933
28	—	—	359	440	520	603	690	777	869	961
29	—	—	371	454	536	621	711	801	895	989
30	—	—	383	468	553	640	732	824	921	1018
31	—	—	395	482	569	659	753	848	947	1046
32	—	—	—	496	586	678	775	871	973	1074
33	—	—	—	510	602	697	796	895	999	1103
34	—	—	—	524	619	715	817	918	1025	1131
35	—	—	—	539	635	734	838	942	1051	1159
36	—	—	—	553	652	753	860	966	1077	1187
37	—	—	—	567	668	772	881	989	1103	1216
38	—	—	—	—	685	791	902	1013	1129	1244
39	—	—	—	—	701	810	923	1036	1155	1272
40	—	—	—	—	718	828	944	1060	1181	1301
41	—	—	—	—	734	847	966	1083	1207	1329
42	—	—	—	—	751	866	987	1107	1233	1357
43	—	—	—	—	767	885	1008	1130	1259	1385
44	—	—	—	—	—	904	1029	1154	1284	1414
45	—	—	—	—	—	923	1051	1178	1310	1442
46	—	—	—	—	—	941	1072	1201	1336	1470
47	—	—	—	—	—	960	1093	1225	1362	1498
48	—	—	—	—	—	979	1114	1248	1388	1527
49	—	—	—	—	—	998	1135	1272	1414	1555
50	—	—	—	—	—	—	1157	1295	1440	1583
51	—	—	—	—	—	—	1178	1319	1466	1612
52	—	—	—	—	—	—	1199	1342	1492	1640
53	—	—	—	—	—	—	1220	1366	1518	1668
54	—	—	—	—	—	—	1246	1389	1544	1696
55	—	—	—	—	—	—	1263	1413	1570	1725
56	—	—	—	—	—	—	—	1437	1593	1753
57	—	—	—	—	—	—	—	1460	1622	1781
58	—	—	—	—	—	—	—	1484	1648	1809
59	—	—	—	—	—	—	—	1507	1674	1839
60	—	—	—	—	—	—	—	1531	1700	1866

Table B.4 Approximate Wetted Areas for Horizontal Tanks with Flat Heads

Tank Length (ft)	Tank Diameter (ft)									
	3	4	5	6	7	8	9	10	11	12
61	—	—	—	—	—	—	—	—	1726	1894
62	—	—	—	—	—	—	—	—	1752	1923
63	—	—	—	—	—	—	—	—	1778	1951
64	—	—	—	—	—	—	—	—	1803	1979
65	—	—	—	—	—	—	—	—	1829	2007
66	—	—	—	—	—	—	—	—	1855	2036
67	—	—	—	—	—	—	—	—	—	2064
68	—	—	—	—	—	—	—	—	—	2092
69	—	—	—	—	—	—	—	—	—	2120
70	—	—	—	—	—	—	—	—	—	2149
71	—	—	—	—	—	—	—	—	—	2177
72	—	—	—	—	—	—	—	—	—	2205

For SI units, 1 ft = 0.3 m; 1 ft^2 = 0.09 m^2.

Annex C Temporarily Out of Service, Closure in Place, or Closure by Removal of Underground Storage Tanks

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

C.1 General.

C.1.1 Care is required not only in the handling and use of flammable or combustible liquids but also in the process of rendering temporarily out of service, closing, or removing tanks that have held flammable or combustible liquids. This is particularly true of underground service station tanks that are most frequently used for the storage of motor fuel and occasionally for the storage of other flammable or combustible liquids, such as crankcase drainings, which can contain some gasoline. Through carelessness, explosions have occurred because flammable or combustible liquid tanks have not been properly conditioned before being rendered temporarily out of service, closed, or removed.

C.1.2 In order to prevent accidents caused by improper conditioning, it is recommended that the procedures outlined in this annex be followed when underground tanks are temporarily taken out of service, closed, or removed.

C.1.3 Underground tanks taken out of service can be safeguarded or disposed of by any one of the following three means:

(1) Placement in a temporarily out-of-service condition. Tanks should be rendered temporarily out of service only when it is planned that they will be returned to active service within a reasonable period or pending closure in place or closure by removal.

(2) Permanent closure in place, with proper safeguarding.

(3) Permanent closure by removal.

C.1.4 In cases where tanks are either rendered temporarily out of service or permanently closed, records should be kept of tank size, location, date of closure, and method used for placing the closed tank in a safe condition.

C.1.5 Procedures for carrying out each of the methods in C.1.3 of disposing of underground tanks are described in Section C.2 through Section C.6. No cutting torch or other flame- or spark-producing equipment should be used until the tank has been completely purged or otherwise rendered safe. In each case, the steps given should be carried out successively.

C.2 Rendering Underground Storage Tanks Temporarily Out of Service.

C.2.1 When the underground storage tank system (UST) is temporarily out of service for less than 3 months, the owners and operators should comply with the following:

(1) Continue operation and maintenance of corrosion protection. Requirements can be found in U.S. Environmental Protection Agency (EPA), 40 CFR 280.31, “Technical Standards and Requirements for Owners and Operators of Underground Storage Tanks.”

(2) Continue operation and maintenance of any release detection in accordance with U.S. EPA, 40 CFR 280, Subpart D, or empty the UST system by removing all materials so that no more than 1 in. (25 mm) of residue, or 0.3 percent by weight of the total capacity of the UST system, remains in the system.

C.2.2 When a UST system is temporarily out of service for 3 months or more, owners and operators should also comply with the following requirements:

(1) Leave vent lines open and functioning

(2) Cap or plug all other lines such as fill line, gauge opening, pump suction, and ancillary equipment and secure against tampering

C.3 Permanent Closure of Underground Storage Tanks.

When a UST system is temporarily closed for more than 12 months, owners and operators should permanently close the UST system in accordance with U.S. EPA, 40 CFR 280.71–280.74. An extension of this 12-month period can be granted by the implementing agency. However, before such an extension can be applied for, a site assessment should be completed in accordance with U.S. EPA, 40 CFR 280.72.

C.4 Closure in Place of Underground Storage Tanks.

C.4.1 At least 30 days before beginning closure procedures, owners and operators should notify the implementing agency of their intent to close unless such action is in response to corrective action proceedings.

C.4.2 Closure of tanks either in place or by removal requires the owners and operators to measure for the presence of a release where contamination is most likely to be present at the UST site. This requirement can be satisfied if one of the external release detection methods allowed in 40 CFR 280.43(e) and (f) is operating in accordance with the requirements in Part 280.43 at the time of closure and indicates no release has occurred.

C.4.3 Prepare a safe workplace by following the special safety precautions and cleaning and closure procedures in either of the following documents:

(1) API 1604, *Removal and Disposal of Used Underground Petroleum Storage Tanks*

(2) NEIWPCC, *Tank Closure Without Tears: An Inspector's Safety Guide*

C.4.4 Safe work preparation should include the following:

(1) No smoking in the area.

(2) Shutting down all open flame and spark-producing equipment not necessary for the removal of the underground tank.

(3) Using only hand tools to expose tank fittings and preparing for the vapor-freeing procedures.

(4) Controlling static electricity or providing a conductive path to discharge static electricity by bonding and grounding equipment and vehicles.

(5) Roping off tank area from pedestrian and vehicular traffic.

(6) Locating and marking all utility lines on site.

(7) Determining meteorological conditions. Vapor accumulation can occur on still and high-humidity days. Under these conditions, test the area for vapor accumulation (refer to C.4.10) and if present either provide additional forced ventilation or delay the job until there is a breeze and it is less humid. Excavated soil should be tested for vapor release. Artificial ventilation or repeated turning of excavated soil might be necessary to avoid ignitible concentration of vapors.

(8) Ensuring that personnel are wearing hard hats, safety shoes, and safety glasses and that a combustible gas indicator is available. Providing any other safety measures or methods that might be required to meet local requirements.

C.4.5 Remove all flammable or combustible liquid and residue from the tank and from all connecting lines.

C.4.6 Residual product and solids should be disposed of properly.

C.4.7 Excavate to the top of the tank.

C.4.8 Disconnect the suction, inlet, gauge, and all other tank fixtures. The vent line should remain connected until the tank is purged.

C.4.9 Either purge the tank of flammable vapors or inert the potentially explosive atmosphere in the tank.

C.4.9.1 Purging or ventilating the tank replaces the flammable vapors in the tank with air, reducing the flammable mixture of fuel and oxygen below the lower explosive limit or lower flammable limit (LFL). Two methods can be used to introduce air into the tank. One is the use of a "diffused-air blower" to pump air into the bottom of the tank through the fill pipe or a properly bonded air-diffusing pipe. The second method is the use of an "eductor-type air mover," typically driven by compressed air. It draws vapors out of the tank and brings fresh air into the tank. The vent pipe can be used to exhaust vapors 12 ft (3.7 m) above grade and 3 ft (0.9 m) from any roof lines.

C.4.9.2 Inerting the tank does not replace the flammable vapors but instead reduces the concentration of oxygen to a level insufficient to support combustion (refer to C.4.10). Two inert gases can be used. Carbon dioxide gas can be generated by crushing and distributing dry ice evenly over the bottom of the tank. The dry ice will release carbon dioxide as it warms. Nitrogen gas can be pumped into the tank from a hose through the fill hole to the bottom of the tank. Oxygen will be reintroduced into the tank unless all holes are effectively plugged except for the vent line.

C.4.10 The tank should be tested to determine if it is safe by one of the following procedures:

(1) When purging, a combustible gas indicator is used to measure the reduction in the concentration of flammable vapors. The meter reads from 0 to 100 percent of the LFL. The goal is to achieve a reading of 10 to 20 percent LFL for petroleum tanks.

(2) When inerting, an oxygen meter is used to determine when a tank has been successfully inerted. The meter reads from 0 to 100 percent oxygen content. The goal is to achieve a reading of 1 to 10 percent, which is safe for most petroleum products.

C.4.11 Fill the tank completely with an inert solid material. One or more holes can be cut in the tank top if existing tank openings are not adequate for the introduction of the inert material. Cap or remove remaining underground piping. The tank can now be backfilled.

C.5 Permanent Removal of Underground Storage Tanks.

C.5.1 Observe all procedures listed under Section C.4, except for C.4.11, filling the tank with an inert solid material and backfilling the excavation.

C.5.2 After the tank has been made safe by following purging or inerting procedures and before it is removed from the excavation, plug or cap all accessible holes. One plug should have a ⅛ in. (3 mm) vent hole to prevent the tank from being subjected to excessive differential pressure caused by temperature changes. This vent should be positioned on top of the tank during subsequent transportation or storage.

C.5.3 Excavate around the tank to uncover it for removal. Remove the tank from the excavation and check for corrosion holes in the tank shell. Use screwed boiler plugs to plug any corrosion holes.

C.5.4 Tanks should be labeled with information about the former contents, present vapor state, vapor-freeing treatment method, and a warning against reuse.

C.5.5 Tanks should be removed from the site promptly and preferably the same day as taken from the ground because additional vapor can be released from liquid absorbed in tank wall corrosion or residues. However, before removal, the tank atmosphere must be checked to ensure the flammable vapor concentration does not exceed safe levels.

C.6 Disposal of Underground Storage Tanks.

C.6.1 If the reuse of a tank is permitted by the controlling jurisdiction, the tank should be certified that it is tight, structurally sound, and will meet all requirements of a new installation.

C.6.2 The storage of used tanks should be in secure areas where the public will not have access. Tanks should be rendered safe consistent with C.4.9 and C.4.10 and vented consistent with C.5.2.

C.6.3 If a steel tank is to be disposed of, it should be retested for flammable vapors and, if necessary, again rendered gas-free. Tanks that have been lined internally or coated externally with fiberglass, epoxy-based, or similar materials might not be accepted by scrap processors. Before releasing to a scrap metal dealer, a sufficient number of holes or openings should be made in the tank to render it unfit for further use. NFPA 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair*, provides information on safe procedures for such operations.

C.6.4 If the tank to be disposed of is nonmetallic or is a steel tank lined internally or coated externally with fiberglass, epoxy-based, or similar materials, it might not be accepted by scrap metal dealers. An alternative disposal method would be to cut up the tank in sections suitable for disposal in a sanitary landfill.

C.7 Record Keeping.

Record keeping is required to demonstrate compliance with closure requirements under 40 CFR 280.74. The results of the excavation zone assessment required in Part 280.72 should be maintained for at least 3 years after completion of permanent closure.

C.8 Resources.

Other resources to check for information related to safety during tank closure include the following:

(1) API 1604, *Removal and Disposal of Used Underground Petroleum Storage Tanks*

(2) API 1631, *Interior Lining of Underground Storage Tanks*

(3) API 2015, *Cleaning Petroleum Storage Tanks*

(4) API 2217A, *Guidelines for Work in Inert Confined Spaces in the Petroleum Industry*

(5) API 2219, *Safe Operating Guidelines for Vacuum Trucks in Petroleum Service*

(6) OSHA 2226, *Excavation & Trenching Operations*

(7) NIOSH, *Criteria for Recommended Standard for Working in Confined Spaces*

(8) NIOSH 87–113, *A Guide to Safety in Confined Spaces*

(9) NFPA 69, *Standard on Explosion Prevention Systems* (table with minimum oxygen levels necessary to support combustion for various products)

(10) NFPA 77, *Recommended Practice on Static Electricity*

(11) NFPA 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair*

(12) NFPA 306, *Standard for the Control of Gas Hazards on Vessels* (practical procedures for vapor-freeing tanks and testing guidance)

(13) NEIWPCC, *Tank Closure Without Tears: An Inspector's Safety Guide*

Annex D Development of Fire Protection System Design Criteria for Chapter 16 and Suggested Fire Protection for Some Containers of Flammable and

Combustible Liquids Not Covered in Chapter 16

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

D.1 General.

The development of suppression-oriented protection criteria for liquids in containers relies almost exclusively on the evaluation of large-scale fire test data. Characterization of fire development, fire spread to adjacent containers/materials, suppression system activation, and suppression system effectiveness based on first principles is not well established. Reliance on actual test data for all situations and scenarios is not, however, practical from a cost standpoint. Development of NFPA 30 protection criteria, therefore, relies on data from representative test scenarios. Alternative materials and scenarios are then evaluated in terms of the specific test data, historical test data, and engineering experience with the hazards. Pending the complete development of engineering tools to evaluate hazards, this approach represents the best method to meet the NFPA policy that codes and standards be scientifically based.

D.2 Summary of Fire Protection Design Criteria.

In developing the fire protection criteria set forth in Chapter 16, the NFPA 30 Container Protection Task Group evaluated numerous fire tests, 147 of which have been summarized in the *Directory of Fire Tests Involving Storage of Flammable and Combustible Liquids in Containers,* 3rd edition. This directory was authored by David P. Nugent, Schirmer Engineering Corporation, and is available by special arrangement with Schirmer Engineering Corporation from the Society of Fire Protection Engineers. Users of this code who wish to investigate details of the fire tests on which Chapter 16 is based are referred to this directory.

The summaries in Table D.2(a) through Table D.2(l) provide a brief justification statement for each entry in Table 16.5.2.1 through Table 16.5.2.12. Each entry in Table 16.5.2.1 through Table 16.5.2.12 includes a fire test reference number that appears in the last column of each table and is keyed to one of the following tables. The test numbers given in the justification statements refer to the tests reported in Nugent's directory. As noted, in some cases the NFPA 30 Container Protection Task Group exercised some judgment in evaluating the test data in order to develop fire protection criteria for various combinations of class of liquid, container type and size, and storage arrangement.

Table D.2(a) Summary of Fire Test References for Table 16.5.2.1

Ref. No.	Technical Justification and Test Identifier in Directory
1	Results of Test S-42, with extrapolation of data to allow increase in maximum ceiling height from 27 ft (8.2 m) to 30 ft (9.1 m).
2	Results of Test S-40, with extrapolation of data to allow increase in maximum ceiling height from 27 ft (8.2 m) to 30 ft (9.1 m).
3	Results of Tests S-22 through S-44, with emphasis on Test S-40, in which no ceiling sprinklers operated. Test S-26 justifies increasing maximum container size from 1 gal (3.8 L) to 5 gal (19 L).
4	Extrapolation of data in Ref. No. 3. Reduced hazard of Class IIIB liquids justifies increase in allowable storage height and maximum ceiling height and decrease in required ceiling sprinkler design area.
5	Based on data in Ref. No. 3 above. Potential for larger spill justifies increase in ceiling sprinkler design density and disallowing quick-response sprinklers. In addition, Tests 572 through 576 indicate the need for face sprinklers at the first level at each rack upright to prevent collapse of the rack due to fire.

Table D.2(a) Summary of Fire Test References for Table 16.5.2.1

Ref. No.	Technical Justification and Test Identifier in Directory
6	Results of Tests S-22 through S-44. Reduced hazard of Class IIIB liquids justifies increase in allowable storage height and maximum ceiling height and decrease in required ceiling sprinkler design density. Increased container size justifies increase in ceiling sprinkler design area compared to Ref. No. 4.
7	Results of Test S-31.
8	Results of Tests S-22 through S-44, with emphasis on Test S-40. Use of relieving-style container is expected to reduce potential for container rupture, but could contribute to rate of heat release during a fire.
9	Based on data in Ref. No. 4 and recognition that there is little advantage to use of relieving-style containers for Class IIIB liquids.
10	Results of Tests S-22 through S-46. See also Ref. No. 5. Increase in ceiling sprinkler design density justifies in-rack sprinklers at every other level, rather than at every level. In addition, Tests 572 through 576 indicate the need for face sprinklers at the first level at each rack upright to prevent collapse of the rack due to fire.
11	Based on data in Ref. No. 6 and recognition that there is little advantage to use of relieving-style containers for Class IIIB liquids.
12	Based on protection criteria recommended for portable tanks in Appendix D of 1993 edition of NFPA 30 and on results of Tests S-45 and S-46. In addition, Tests 572 through 576 indicate the need for face sprinklers at the first level at each rack upright to prevent collapse of the rack due to fire.
13	Based on protection criteria recommended for portable tanks in Appendix D of 1993 edition of NFPA 30 and data in Ref. No. 6 and recognition that there is little advantage to use of relieving-style containers for Class IIIB liquids.

Table D.2(b) Summary of Fire Test References for Table 16.5.2.2

Ref. No.	Technical Justification and Test Identifier in Directory
1	Results of Test S-15.
2	Results of Test S-5 and Tests S-13 through S-15, with particular emphasis on Test S-5.
3	Results of Test S-5 and Tests S-13 through S-18, with application of engineering judgment to Test S-13.
4	Results of Test S-5 and Tests S-19 through S-21. Larger container size justifies increased ceiling sprinkler design density over that specified in Ref. No. 2.
5	Results of Test S-5 and Tests S-13 through S-18 and protection criteria recommended in Appendix D, Table D-2.2 of 1993 edition of NFPA 30. Quick-response sprinklers are allowed based on experience in testing containers not greater than 19 L (5 gal) capacity.
6	Results of Test S-5 and Tests S-13 through S-21 and protection criteria recommended in Appendix D, Table D-2.2 of 1993 edition of NFPA 30.
7	Results of Test S-5 and Tests S-13 through S-21 and protection criteria recommended in Appendix D, Table D-2.2 of 1993 edition of NFPA 30.
8	Results of Test S-18, with consideration given to Tests S-16 and S-17.
9	Results of Test S-5 and Tests S-19 through S-21. Use of relieving-style containers justifies increase in maximum ceiling height.
10	Based on data in Ref. Nos. 4 and 9. Increased ceiling sprinkler design density allows storage two tiers high.

Table D.2(b) Summary of Fire Test References for Table 16.5.2.2

Ref. No.	Technical Justification and Test Identifier in Directory
11	Based on data in Ref. No. 5 and recognition that there is little advantage to use of relieving-style containers for Class IIIB liquids.
12	Based on data in Ref. No. 6 and recognition that there is little advantage to use of relieving-style containers for Class IIIB liquids.
13	Based on data in Ref. No. 7 and recognition that there is little advantage to use of relieving-style containers for Class IIIB liquids.
14	Based on protection criteria recommended in Appendix D, Table D-2.2 of 1993 edition of NFPA 30, with consideration given to results of Tests S-19 through S-21.
15	Based on protection criteria recommended in Appendix D, Table D-2.2 of 1993 edition of NFPA 30, with consideration given to results of Tests S-19 through S-21.
16	Based on protection criteria recommended in Appendix D, Table D-2.2 of 1993 edition of NFPA 30, with consideration given to results of Tests S-19 through S-21.
17	Based on protection criteria recommended in Appendix D, Table D-2.2 of 1993 edition of NFPA 30, with consideration given to results of Tests S-19 through S-21.

Table D.2(c) Summary of Fire Test References for Table 16.5.2.3

Ref. No.	Technical Justification and Test Identifier in Directory
1	Results of Test S-33, with consideration given to results of Tests S-32 and S-34.
2	Results of Tests S-45 and S-46.
3	Results of Tests S-45 and S-46. Reduced hazard of Class IIIB liquids justifies in-rack sprinklers at every other level, rather than at every level.
4	Results of Test S-33, with consideration given to results of Tests S-32 and S-34. Use of relieving-style containers justifies reduction in in-rack sprinkler design criteria, compared to that specified in Ref. No. 1.
5	Results of Tests S-45 and S-46. Use of relieving-style containers justifies reduction in in-rack sprinkler design criteria, compared to that specified in Ref. No. 1.
6	Based on data in Ref. No. 3.

Table D.2(d) Summary of Fire Test References for Table 16.5.2.4

Ref. No.	Technical Justification and Test Identifier in Directory
1	Results of Test S-12, with extrapolation of data to allow increase in maximum ceiling height from 25 ft (7.6 m) to 30 ft (9.2 m).
2	Results of Test S-6, with extrapolation of data to allow increase in maximum ceiling height from 25 ft (7.6 m) to 30 ft (9.2 m).

Table D.2(d) Summary of Fire Test References for Table 16.5.2.4

Ref. No.	Technical Justification and Test Identifier in Directory
3	Results of Test S-6 and Tests S-19 through S-21, with extrapolation of data to allow increase in maximum ceiling height from 25 ft (7.6 m) to 30 ft (9.2 m).
4	Results of Test S-51.
5	Based on data in Ref. No. 3. Use of relieving-style containers allows storage two tiers high.
6	Results of Test S-55.
7	Results of Test S-56.

Table D.2(e) Summary of Fire Test References for Table 16.5.2.5

Ref. No.	Technical Justification and Test Identifier in Directory
1	Results of Tests P-21 through P-31.
2	Results of Tests P-67 and P-68.

Table D.2(f) Summary of Fire Test References for Table 16.5.2.6

Ref. No.	Technical Justification and Test Identifier in Directory
1	Results of Test S-47.

Table D.2(g) Summary of Fire Test References for Table 16.5.2.7

Ref. No.	Technical Justification and Test Identifier in Directory
1	Results of Tests P-32 through P-35.
2	Results of Tests P-40 through P-43.
3	Results of Tests P-36 through P-38.

Table D.2(h) Summary of Fire Test References for Table 16.5.2.8

Ref. No.	Technical Justification and Test Identifier in Directory
1	Results of Test S-68.
2	Results of Test S-70.
3	Results of Test S-60.
4	Results of Test S-62.
5	Results of Test S-65.
6	Results of Tests S-57, S-58, and S-59.
7	Results of Test S-66.

Table D.2(i) Summary of Fire Test References for Table 16.5.2.9

Ref. No.	Technical Justification and Test Identifier in Directory
1	Results of Tests P-48, P-49, and P-50.
2	Results of Tests P-51, P-52, and P-53.

Table D.2(j) Summary of Fire Test References for Table 16.5.2.10

Ref. No.	Technical Justification and Test Identifier in Directory
1	Results of Tests P-54 and P-55.

Table D.2(k) Summary of Fire Test References for Table 16.5.2.11

Ref. No.	Technical Justification and Test Identifier in Directory
1	Results of Tests S-77 through S-82.

Table D.2(l) Summary of Fire Test References for Table 16.5.2.12

Ref. No.	Technical Justification and Test Identifier in Directory
1	S-61.

D.3 Recommended Fire Protection System Design Criteria for Class IA Liquids.

There are a number of commodities for which there were no or insufficient test data to develop definitive protection tables. One example is Class IA liquids. Table D.3(a) through Table D.3(c) contain the protection that was contained in Appendix D of the 1993 edition of NFPA 30 for Class IA liquids.

Additional useful information for evaluating fire risk can be found in the technical report, “A Fire Risk Analysis Model for Assessing Options for Flammable and Combustible Liquid Products in Storage and Retail Occupancies” by Dr. John R. Hall, Jr., NFPA.

Table D.3(a) Foam-Water Sprinkler Protection for Single- or Double-Row Rack Storage of Class IA Liquids in Metal Containers (Nonmiscible Liquids or Miscible Liquids with >50% by Volume Flammable Contents)

	Ceiling	
	Sprinkler Type	

Additional useful information for evaluating fire risk can be found in the technical report, “A Fire Risk Analysis Model for Assessing Options for Flammable and Combustible Liquid Products in Storage and Retail Occupancies” by Dr. John R. Hall, Jr., NFPA.

Table D.3(a) Foam-Water Sprinkler Protection for Single- or Double-Row Rack Storage of Class IA Liquids in Metal Containers (Nonmiscible Liquids or Miscible Liquids with >50% by Volume Flammable Contents)

				Ceiling					
				Sprinkler Type					
Liquid Class	**Container Size and Arrangement (gal)**	**Storage Height (ft)**	**Ceiling Height (ft)**	**Orifice[a]**	**Response[b]**	**Density (gpm/ft^2)**	**Design Area[c] (ft^2)**	**In-Rack Sprinkler Protection**	**Note**
IA	>5 and ≤60	25	30	STD or LO	SR	0.30	1500	Every level	2

For SI units, 1 ft = 0.3 m; 1 psi = 6.9 kPa; 1 gal = 3.8 L; 1 gpm/ft^2 = 40.7 $L/min/m^2$ = 40.7 mm/min.

Notes:

Space in-rack sprinklers on maximum 9 ft centers, staggered vertically. Base design on 30 gpm per head, with six hydraulically most remote heads operating in each of upper three levels. Sprinklers are STD or LO, QR or SR, 165°F (74°C) operating temperature, with shields. Hydraulic design can be reduced to three heads operating per level — three levels operating simultaneously when using a pre-primed foam-water system installed in accordance with NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*, and maintained according to NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

[a]ELO sprinklers are preferred when installed according to the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems* (minimum 10 psi end head pressure). STD = standard orifice, LO = large orifice, ELO = extra-large orifice.

[b]SR = standard response.

[c]High-temperature ceiling sprinklers.

Table D.3(b) Water Sprinkler Protection for Single- or Double-Row Rack Storage of Class IA Liquids in Metal Containers (Nonmiscible Liquids or Miscible Liquids with >50% by Volume Flammable Contents)

				Ceiling					
				Sprinkler Type					
Liquid Class	**Container Size and Arrangement (gal)**	**Storage Height (ft)**	**Ceiling Height (ft)**	**Orifice[a]**	**Response[b]**	**Density (gpm/ft^2)**	**Design Area[c] (ft^2)**	**In-Rack Sprinkler Protection**	**Notes**
IA	≤5	25	30	LO or ELO	SR	0.40	3000	Every level	2
	>5 and ≤60	25	30	LO or ELO	SR	0.60	3000	Every level	2

For SI units, 1 ft = 0.3 m; 1 psi = 6.9 kPa; 1 gal = 3.8 L; 1 gpm/ft^2 = 40.7 $L/min/m^2$ = 40.7 mm/min.

Notes:

Space in-rack sprinklers on maximum 9 ft centers staggered vertically, 30 gpm per head, STD or LO, QR, with shields, 165°F (74°C), six hydraulically most remote sprinklers each level (upper three levels) operating. Eight sprinklers operating, if only one level.

[a]ELO sprinklers are preferred when installed according to the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems* (minimum 10 psi end head pressure). STD = standard orifice, LO = large orifice, ELO = extra-large orifice.

[b]SR = standard response.

[c]High-temperature ceiling sprinklers.

Table D.3(b) Water Sprinkler Protection for Single- or Double-Row Rack Storage of Class IA Liquids in Metal Containers (Nonmiscible Liquids or Miscible Liquids with >50% by Volume Flammable Contents)

				Ceiling					
				Sprinkler Type					
Liquid Class	Container Size and Arrangement (gal)	Storage Height (ft)	Ceiling Height (ft)	Orifice[a]	Response[b]	Density (gpm/ft^2)	Design Area[c] (ft^2)	In-Rack Sprinkler Protection	Notes

Table D.3(c) Water Sprinkler Protection for Bulk or Palletized Storage of Class IA Liquids in Metal Containers (Nonmiscible Liquids or Miscible Liquids with >50% by Volume Flammable Contents)

				Ceiling				
				Sprinkler Type				
Liquid Class	Container Size and Arrangement (gal)	Storage Height (ft)	Ceiling Height (ft)	Orifice[a]	Response[b]	Density (gpm/ft^2)	Design Area[c] (ft^2)	Notes
IA	≤5	5	N/A	STD or LO	SR	0.30	3000	1
	>5 and ≤60	5 (1-high)	N/A	LO or ELO	SR	0.60	5000	1

For SI units, 1 ft = 0.3 m; 1 psi = 6.9 kPa; 1 gal = 3.8 L; 1 gpm/ft^2 = 40.7 L/min/m^2 = 40.7 mm/min.

Notes:

Minimum hose stream demand 750 gpm for 2 hours.

[a]ELO sprinklers are preferred when installed according to the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems* (minimum 10 psi end head pressure). STD = standard orifice, LO = large orifice, ELO = extra-large orifice.

[b]SR = standard response.

[c]High-temperature ceiling sprinklers.

D.4 Recommended Fire Protection System Design Criteria for High Flash Point Class IIIB Liquids.

Table D.4(a) provides recommended sprinkler system design criteria for Class IIIB liquids having flash points greater than 450°F (230°C). Table D.4(b) provides cross-references to fire tests (summarized in the SFPE *Directory of Fire Tests Involving Storage of Flammable and Combustible Liquids in Small Containers*, 3rd edition), on which these recommendations are based.

Table D.4(a) Water Sprinkler Protection for Single-, Double-, or Multiple-Row Open Frame Rack Storage of (Flash Point 450°F) in Plastic Containers (Nonmiscible Liquids or Miscible Liquids with >50% by Volume Con

	Sprinkler Protection Criteria

Table D.4(a) provides recommended sprinkler system design criteria for Class IIIB liquids having flash points greater than 450°F (230°C). Table D.4(b) provides cross-references to fire tests (summarized in the SFPE *Directory of Fire Tests Involving Storage of Flammable and Combustible Liquids in Small Containers*, 3rd edition), on which these recommendations are based.

Table D.4(a) Water Sprinkler Protection for Single-, Double-, or Multiple-Row Open Frame Rack Storage of (Flash Point 450°F) in Plastic Containers (Nonmiscible Liquids or Miscible Liquids with >50% by Volume Con

							Sprinkler Protection Criteria	
Liquid Type or Closed-Cup Flash Point (°F)	Container Size (gal)	Maximum Building or Ceiling Height (ft)	Packaging Type	Maximum Storage Height (ft)	Minimum Aisle Width (ft)	Rack Width (ft)	Ceiling Sprinkler Type, Temperature Rating	Fire I Sch Sp Syste
≥450	≤5	30	Cartoned	25	8	≤9	Any	Schen *(see 1*
							K-14.0 ESFR	12 @
							ordinary standard spray sprinkler	Schen *(see D*
				15	8	≤9	Any	Schen *(see 1*
							K-14 .0 ESFR	12 @
							ordinary standard spray sprinkler	Schen *(see D*
			Uncartoned or mixed cartoned and uncartoned	25	8	≤9	Any	Schen *(see 1*
							Standard spray sprinkler	Schen *(see D*

For SI units, 1 ft = 0.3 m.
*See Table D.4(b) for references to fire tests on which the protection criteria given in this table are based.

Table D.4(b) Summary of Fire Test References for Table D.4(a)

Ref. No.	Technical Justification and Test Identifier in Directory
1	Results of Tests P-21 through P-31.
2	Results of Test P-46.
3	Results of Tests P-56 and P-57.
4	Results of Test P-44.

D.4.1 In-Rack Sprinklers In-rack sprinklers should be installed in accordance with 16.6.1, Fire Protection System Design Scheme "A," or with D.4.2, Fire Protection System Design Scheme "D." Vertical baffles should not be provided between in-rack sprinklers.

D.4.2 Fire Protection System Design Scheme "D." In-rack sprinklers should be installed in accordance with Figure D.4.2(a)(a) or Figure D.4.2(b), whichever is applicable.

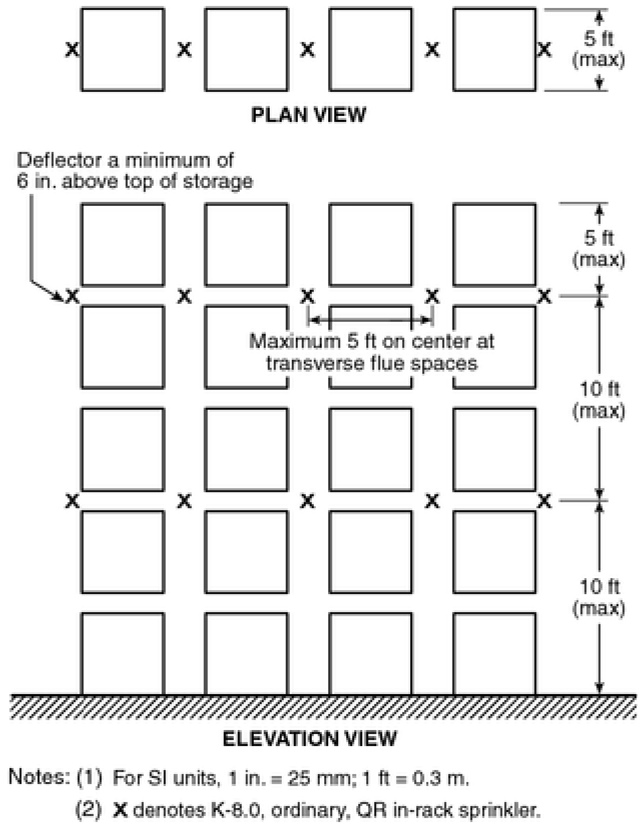


FIGURE D.4.2(a) Single-Row Rack Sprinkler Layout for Fire Protection System Design Scheme "D."

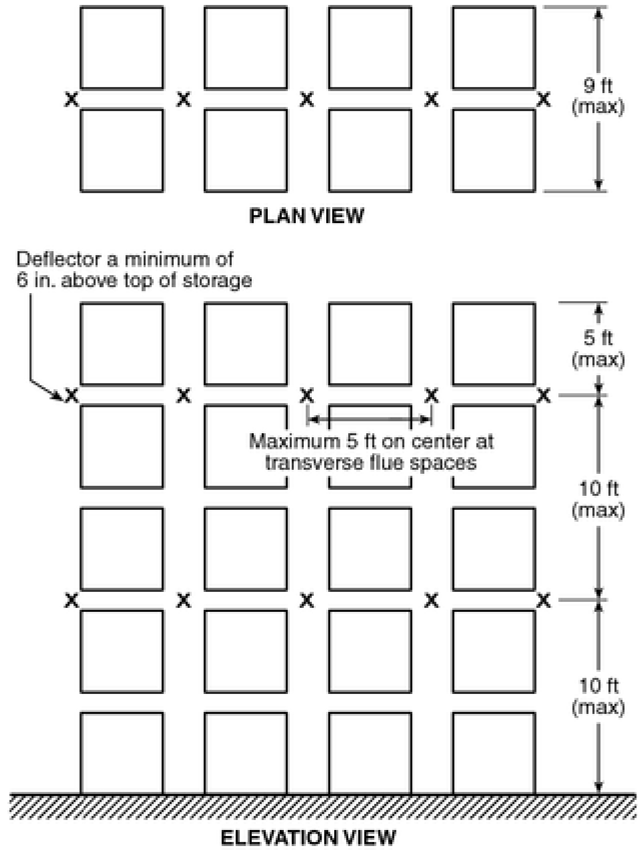


FIGURE D.4.2(b) Double-Row Rack Sprinkler Layout for Fire Protection System Design Scheme "D."

D.4.2.1 In-rack sprinklers should be listed or approved, ordinary temperature-rated, quick response sprinklers having a nominal K-factor of 8.0, and should be designed to provide 30 gpm (113 L/min) out of the hydraulically most remote eight sprinklers if one level is installed or the most remote fourteen sprinklers (seven on two levels) if two or more levels are provided.

D.4.3 Ceiling Sprinklers. Ceiling sprinklers should be designed to provide a minimum density of 0.3 gpm/ft^2 (12.2 mm/min) over the most remote 2000 ft^2 (185 m^2) using ordinary temperature-rated, standard response spray sprinklers, having a nominal K-factor of 8.0 or 11.2.

D.4.4 Water Demand. The ceiling and in-rack sprinkler water demands should be balanced at the point of connection to the water supply. A 500 gpm (1900 L/min) hose stream allowance should be provided.

D.5 Recommended Fire Protection Design Criteria for High-Expansion Foam Fire Protection for Nonmiscible Liquids.

Table D.5 provides recommended design criteria for high-expansion foam protection for Class IB, Class IC, Class II, and Class III liquids in plastic containers in corrugated cardboard cartons.

D.4.4 Water Demand. The ceiling and in-rack sprinkler water demands should be balanced at the point of connection to the water supply. A 500 gpm (1900 L/min) hose stream allowance should be provided.

D.5 Recommended Fire Protection Design Criteria for High-Expansion Foam Fire Protection for Nonmiscible Liquids.

Table D.5 provides recommended design criteria for high-expansion foam protection for Class IB, Class IC, Class II, and Class III liquids in plastic containers in corrugated cardboard cartons.

Table D.5 High-Expansion Foam Protection of Single- and Double-Row, Open-Frame Rack Storage of Class IB and III Liquids in Plastic Containers

Liquid Class (non-polar liquids)	Container Size (gal)	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Maximum Submergence Time (min)	Fire Detection and System Activation	Notes
IB, IC, II, IIIA, IIIB	≤1†	18	33	2	Optical flame or equivalent	None

For SI units, 1 gal = 3.8 L; 1 ft = 0.3 m.

*See Table D.2(g) for references to fire tests on which fire protection criteria are based.

†Liquids in polyethylene or polypropylene containers packaged in corrugated cardboard cartons.

D.5.1 The foam system should be designed and installed in accordance with NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*, with this section, and with Table D.5.

D.5.2 There should be at least two foam generator units drawing fresh inlet air from an area outside of the area being protected.

D.5.3 Submergence time should not exceed 2 minutes for either sprinklered or unsprinklered areas. Failure of a single foam generator should not result in a submergence time exceeding 4 minutes.

D.5.4 The foam system should be activated by a supplemental detection system capable of detecting a fire originating anywhere within the storage area. Foam system activation should be preceded by a 20-second pre-activation room egress alarm.

D.5.5 Storage of liquids in plastic containers should be in a room separated from other occupancies by minimum 2-hour fire-rated construction. The storage room should be equipped with automatic self-closing Class A or B doors that are interlocked to the detection system.

D.5.6 The roof or ceiling of the storage area should be provided with either of the following:

(1) A minimum 1-hour fire-resistive protection for roof or ceiling structural members

(2) Ceiling sprinklers at a minimum density of 0.45 gpm (18.3 L/min/m^2) over the entire room to protect against high ceiling temperatures during the time required for foam submergence.

D.5.7 Liquid containment should be provided for rooms storing liquids in plastic containers. The liquid containment should provide 4 in. (100 mm) minimum containment. Where ceiling sprinkler protection is used, a drainage and containment system capable of retaining at least 20 minutes of sprinkler discharge should be provided.

D.5.8 Rack storage should be limited to single- or double-row racks. Bay width should not exceed 9 ft (2.7 m).

D.5.9 Racks should be provided with vertical barriers meeting the following requirements:

(1) Barriers should be constructed of plywood at least ⅜ in. (10 mm) thickness or by sheet metal of at least 22 gauge thickness.

(2) Barriers should be located at each rack upright and should extend from rack face through the flue space to the opposite rack face of the storage rack assembly.

D.5.10 Aisle width should not be not less than 7.5 ft (2.3 m). See Table D.5.

D.5.11 These recommendations are based on a series of fire tests conducted by Ansul, Inc. to explore the efficacy of high-expansion foam fire protection on fires involving flammable liquids in plastic containers.

Annex E Suggested Test Protocol for Developing Fire Protection System Design Criteria for Containers of Flammable and Combustible Liquids

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

E.1 Introduction.

The development of fire protection criteria for liquids in containers relies almost exclusively on the evaluation of data from large-scale fire tests and engineering judgment. Characterization of fire development, fire spread to adjacent containers or materials, suppression system activation, and effectiveness of the suppression system based on first principles (i.e., governing scientific theory) is not well established. Reliance on actual test data for all situations and scenarios is not, however, practical from a cost standpoint. The development of the fire protection criteria in Chapter 16 of this code, therefore, relies on data from representative test scenarios and assessment of the risk. Alternative materials and scenarios are then evaluated in terms of the specific test data, historical test data, engineering experience with the hazards, and an assessment of the risk. Pending complete development of engineering tools to evaluate the fire hazards of flammable and combustible liquids, this approach represents the best method to meet the NFPA policy that codes and standards be scientifically based.

This annex provides an example protocol for the testing of flammable and combustible liquids stored in containers. In many cases, test data are then interpolated or extrapolated to develop fire protection design criteria by which the stored commodities can be considered protected. The term *protected* could be interpreted as defining storage where there is essentially zero risk of an uncontrolled incident. Because zero risk is unattainable, it is important that designers and regulators be aware of the limitations when applying the protection criteria based on fire test data and engineering extrapolation. The limitations of the protection criteria are also described in this annex.

With the introduction and widespread use of larger containers, such as intermediate bulk containers (IBCs), and the introduction of alternative container materials, there is a need to evaluate these materials from a fire performance standpoint. There is a need to provide manufacturers, warehouses, and enforcement officials with guidance on developing and evaluating protection criteria where data are not currently available. The following example test protocol is intended to outline guidance for conducting representative fire tests to establish protection criteria for liquids in containers. Specifically, this outline is developed for liquids in large containers, i.e., greater than 5.3 gal (20 L). While there is a substantial amount of data for smaller containers, there is a lack of data for large containers. *(See* E.2.5 *and* E.2.6*)*. Most of these data are for 55 gal (208 L) drums.

E.2 Example Fire Test Protocol for Evaluating Liquids in Large Containers.

Important variables in evaluating hazards for liquids in small containers have been identified (Nugent, 1994). These include liquid properties, container design and size, packaging material, ignition scenario, storage arrangement, and sprinkler system design parameters.

Of particular importance for large containers is control of pressure in the container to prevent a violent rupture and the prevention of a large discharge of liquid. While these are a problem with smaller containers, the hazard to test facilities and personnel increases dramatically for larger containers. A fundamental measure of performance is the limitation of pressure buildup in the container and maintenance of container integrity to prevent a large spill. Prevention of a violent rupture should be tempered by the discharge of liquid and associated heat release through pressure-relieving mechanisms. The pressure-relieving mechanisms can be a designed-in feature or can be inherent in the container material. Container integrity, along with pile or rack stability, is important to prevent a large discharge of liquid. Suppression systems might not be adequate to control a large release of liquid. Engineering tools are available to evaluate specific consequences of uncontrolled pool fires on facility integrity (Gewain, 1996).

The information that follows is provided to aid in the development of protection criteria similar to that developed in Table 16.5.2.1 through Table 16.5.2.4 for steel drums. The intent is to provide guidance for the acceptance of alternative materials/designs under the "protected" classification of stored liquids. The primary basis of this outline is previous testing of drum storage (e.g., Newman et al., 1975).

E.2.1 Storage Configuration.

E.2.1.1 Facility. If containers are to be protected indoors, tests should be conducted in an enclosed facility with minimal impact from the outside environment. In particular, the building height should be representative of the proposed indoor storage height. Building height affects response time of the suppression system, penetration of suppression agent through the fire plume, and response of building structural elements to the threat.

E.2.1.2 Storage Array. A representative array should be selected (e.g., solid pile storage or rack storage). Arrays should consider the width of aisles to adjacent stored materials and whether these materials have higher or lower ignition and fire growth characteristics.

E.2.1.3 Container. The container storing the liquid should be representative of a production-type unit, unless the evaluation is a scoping series to determine container effects. Potential venting capabilities of a container should be identified (i.e., the thermally "weak link" of the constructed assembly). If the container will have an outer wrapping, packaging, or pallet, this should be considered in the overall "container" system.

E.2.1.4 Liquid in Container. The most hazardous liquid to be stored should be evaluated. The hazard of a liquid should be assessed based on its volatility (vapor pressure), heat of combustion, specific gravity, miscibility (water solubility), ignition temperature, flash point, fire point, boiling point, and vapor density. The NFPA 30 rating system, based on flash point, vapor pressure, and boiling point, can be used as a guide to assess the hazard. The other properties should be considered, as they can affect both the hazard and the suppression system effectiveness.

E.2.1.5 Liquid Classes. Class IA liquids should be considered independently from other liquids because of their inherent hazards. Protection criteria can be developed for different classes of liquids, for example, motor oils that have protection criteria different from those for Class IB liquids. For a maximum reasonable hazard, n-heptane has been used for general evaluation for liquids up to and including Class IB. When tests are performed on large containers, water can be substituted in place of the actual flammable liquid to improve the overall safe conduct of the test. It is important to include liquid in the container. Internal pressure should be recorded. The liquid also serves as a heat sink for the container. Structural failure of the container can occur where there is no liquid interfacing with the container (Newman et al., 1975). The container ullage (vapor space) should be representative of actual conditions.

E.2.2 Fire Protection System.

E.2.2.1 The fire protection system proposed for adoption should be represented in the actual test (e.g., deluge sprinkler system, wet or dry pipe closed-head system, foam system, or gaseous agent system). Where system actuation is dependent on auxiliary equipment (e.g., detectors), these devices should be included in the test with representative spacing and response characteristics.

E.2.2.2 For sprinkler suppression systems, representative application rates and sprinkler spacing that would be proposed for adoption should be used.

E.2.2.3 For tests involving closed-head sprinklers, appropriate sprinkler orifice sizes, temperature rating, and response time index (RTI) should be identified and utilized.

E.2.2.4 For deluge and gaseous agent system tests, appropriate detection equipment proposed for protection should be used in testing.

E.2.2.5 For foam system tests, prepriming or the actual foam discharge time from sprinklers should be addressed. The foam concentrate should be listed or approved for the type of liquid.

E.2.3 Fire Scenario.

E.2.3.1 The fire scenario is crucial in determining the hazard of the stored product. It is recognized that an installed suppression system might not be able to protect against an absolute worst-case scenario (e.g., the total release of multiple storage containers). For large containers, the rapid release of contents can pose a significant challenge to an installed suppression system. This is particularly true if it is a highly volatile liquid (e.g., Class I liquid). The philosophy for determining protection effectiveness is predicated on a reasonable anticipated threat. Even with an installed suppression system, there is some risk of a significant loss. Part of this risk is associated with suppression system reliability, which should be addressed in the actual design/specification of protection systems.

E.2.3.2 A representative scenario for large containers was developed during drum storage tests (Newman et al., 1975). The scenario was a liquid gravity leak of 2 gpm to 15 gpm (7.6 L/min to 56.7 L/min) from a hole at or near the bottom of a container. This leak can be simulated by flow from a pipe. If containers are stacked or placed more than one high, then the simulated container leak should be placed high in the total array. The leak should be allowed to flow prior to ignition, simulating fuel spread after the mishap and a delay in ignition. In the tests, 10 gal (38 L) of liquid was allowed to spill before ignition. Additional details on the effects of spill rate and initial spill size for tests involving an aqueous film-forming foam suppression system are provided in other references (Young and Fitzgerald, 1975).

An alternative worst-case scenario could be the total release of liquid from a large container, with ignition delayed until the contents are totally discharged. Ignition of this large pool fire can severely challenge an installed suppression system.

E.2.3.3 If the scenario involves a flowing fuel fire, the recommended length of the test should be equal to the total time of the flow from one container. Alternatively, the evaluation can be terminated shortly after total extinguishment. Time should be allowed to determine any post-extinguishment pressure buildup in containers or subsequent container failure due to inadequate cooling. For water and foam systems, fire control will likely be the measure of performance instead of extinguishment because it is unlikely that the three-dimensional running fuel fire will be extinguished with these agents. If a larger spill rate is used, a reduced test time equal to the time to discharge the contents of one container can be appropriate. The length of a pool fire test would be based on the success or failure of the suppression system to control or extinguish the fire. For portable tanks and intermediate bulk containers, a specific length of fire protection time can be identified.

E.2.4 Measures of Performance.

E.2.4.1 Criteria. Acceptable performance should include, but not be limited to, the following:

(1) Prevent pressure buildup in containers or actual violent ruptures

(2) Prevent substantial loss of liquid from a container

(3) Limit the number of sprinklers operating

(4) Prevent ignition of adjacent target arrays or failure to control a fire in an adjacent target array

(5) Limit temperature of structural or rack steel

(6) Control sustained ceiling gas temperatures

(7) Prevent collapse of the stored containers or arrays

E.2.4.2 Type of Container. The type of container material will affect the establishment of the performance criteria. The prevention of a violent rupture is an important characteristic. The loss of some liquid from a container (particularly by controlled venting) can be deemed acceptable or even preferable. Catastrophic failure of a container (e.g., total content release) can be deemed unacceptable. The resulting large spill might not be controlled (particularly if water sprinklers are used) and can lead to cascading container failures.

E.2.4.3 Preliminary Testing. Scoping tests can be required to determine failure mechanisms and worst-case situations for specific container materials. An example of scoping tests performed to determine failure mechanisms of small metal and plastic containers is detailed in a research report by Hill (1991). Steel drum failure mechanisms are described in a research report by Newman and others (1975). There is a lack of published information on large container failure mechanisms, particularly for IBCs and nonmetallic or composite drums (e.g., fiber drums).

E.2.4.4 Pressure Buildup. A gauge pressure of 15 psi (103 kPa) is an example of a critical pressure in steel drums, above which violent rupture can occur (Newman et al., 1975). Many drums are now rated at a gauge pressure of 44 psi (300 kPa), and some might be rated as high as 70 psi (480 kPa).

E.2.4.5 Loss of Liquid. Loss of any substantial amount of liquid from a container is generally considered as a criterion for failure. For the originally involved container, this can be loss of contents at a rate greater than the design scenario spill rate. Fire spread to the outer limits of the test array is generally considered a failure. For adjacent or target arrays, the level of fire involvement should be considered. Loss due to vapor venting can be considered acceptable. For metallic containers, loss of liquid to a violent rupture can be considered unacceptable.

E.2.4.6 Number of Sprinklers Operating and Operating Time. The number of sprinklers operating and their operating time can be used as a judgment of overall suppression system effectiveness. As the number of sprinklers operating increases, the probability of overall success decreases. The philosophy in combustible liquid and flammable liquid protection has shifted from traditional warehouse success criteria, where a “success” could be judged for a test involving the operation of 30 or more sprinklers. The trend in liquid protection is for more rapid actuation and cooling and control through the use of lower RTI, intermediate level, larger orifice, and ESFR sprinklers.

E.2.4.7 Ignition of Target Arrays. Prevention of the ignition of adjacent targets (e.g., across aisles) is a fundamental measure of performance. If target arrays ignite, adequate protection should be provided (e.g., through the use of in-rack sprinklers or increased suppression agent rate).

E.2.4.8 Integrity of Structural Steel. Structural steel, in the form of building columns, beams, or rack elements, potentially fails at about 1200°F to 1300°F (650°C to 700°C). Scenarios where elements reach this temperature for any prolonged time can be judged unsuccessful for “protected” situations.

E.2.4.9 Integrity of Storage Array. Collapse of stored containers inherently increases the risk of container liquid discharge. It also increases the potential for shielding of a flowing fuel or pool fire, with a resulting increase in violent rupture potential or catastrophic liquid discharge.

E.2.4.10 Spills. Spills of any magnitude might not be suppressed by water-only suppression systems. Water can act to cool containers, but it also spreads the pool fire. For situations where there is the potential for large spills, floor drainage systems can be used to mitigate the spread of burning liquids. The area contained within the drains can be considered for establishing sprinkler design operating areas. Alternatively, foam-water sprinkler systems can be used to control/suppress floor pool fires to prevent burning liquid spread. Where there is rack storage, in-rack sprinklers at every level have demonstrated good cooling for drum storage (Newman et al., 1975).

E.2.4.11 Test Documentation. Test documentation should include test setup, results, and damage assessment. Photographic and video documentation is desirable.

E.2.5 Probability of a Fire Incident and Reliability of Suppression Systems.

E.2.5.1 Inherent in the current "protected" concept of Chapter 16 is a qualitative judgment of unacceptable and acceptable risk. If all other relevant fire and property loss parameters are equal, "unprotected" facilities have a greater relative risk of experiencing an uncontrolled fire that will result in a large loss than will "protected" facilities. An essential part of a risk analysis is identifying all the factors that will contribute to the probability of a fire incident. In addition, the factors leading to a nonoperable suppression system need to be identified. Only after comparing these two probabilities, fire event and system failure, can an accurate assessment of risk be accomplished.

Minimizing the risk in either unprotected or protected facilities can be accomplished by reducing the probability of a fire. These types of "fire safety" practices are common and range from good housekeeping and other management program controls to inherently less combustible and ignitible process and facility designs. This encompasses a broad range of elements, but all contribute to lessening the probability of a fire. In undertaking a risk-based approach to fire safety, as many as possible of these contributing elements should be identified. Once this is done, steps should be taken, within the set of identified elements, to reduce or eliminate their individual probability of occurring.

E.2.5.2 In facilities where fire suppression systems are used to reduce the risk of loss due to fire, the suppression system should be examined to determine its reliability. Suppression systems are multicomponent assemblies, and determining the reliability of the system involves knowing or estimating, within acceptable limits, the probabilities of failure of the individual components or subsystems. It is also essential to understand the conceptual design of the system as it relates to interaction of the components. One method of assessing reliability is by using the system schematics to construct fault trees. The fault trees then serve as system models, and the failure probabilities are propagated through calculation to determine the overall probability of system failure. The fault trees can be extended by additional "AND" logic gates (fire event at the same time as system failure) to determine the suppression system's conditional probability of failure.

E.2.5.3 As with any quantitative probabilistic analysis, the quality of the data used to determine the estimated failure probabilities tends to be the weak link in the analysis. Data on component failure rates and estimates of fire event probability can lack adequate rigor. Incorporating expert opinion on system performance can be desirable or even required, if data are lacking. In addition, the uncertainty inherent in all statistical analysis should be reported for the failure probabilities.

E.2.6 Limitations of Testing and Protection Criteria. The objective of fire testing of large containers is to evaluate plausible scenarios. Attempts have been made to address variables that would contribute to failure or successful protection. All scenarios and probabilities are not addressed by virtue of the limited number of large-scale tests that can be practically conducted and inherent risks that are deemed acceptable, even with protected storage. Protection can be interpreted to mean control, suppression, or extinguishment of a fire for any given scenario. Subsection E.2.6 outlines issues and limitations associated with protected storage.

E.2.6.1 Ignition and Threat Scenarios. Worst-case scenarios (i.e., arson or terrorism) associated with breaches of multiple large containers have not been investigated. In such a scenario, the suppression system could also be rendered inoperative. Protected storage, as intended by this code, does not address this scenario. Attempts have been made in testing to develop a reasonable scenario that is challenging to the commodity and plausible under routine warehouse conditions. Different packaging systems could be more or less vulnerable to different scenarios. Small containers stored in corrugated cartons appear more vulnerable to small ignition sources because of delayed sprinkler actuation. Large containers could also react differently to the initiating scenario, depending on construction of the package. Large containers are typically tested with a relatively small initiating spill and a running fuel source. A large initial spill (i.e., where all the fuel in a container has emptied and is ignited) has not been tested. The relatively short duration of a large, thin spill fire is considered to be addressed by the threat of a much longer duration, shielded running fuel fire. A full range or combination of tests of initial spill size and spill rate has not been made. The philosophy in large container testing is to assume an initial container breach and provide control such that multiple containers do not breach and contribute to a much larger spill.

E.2.6.2 Water and Foam Sprinklers. Water sprinklers will not extinguish most flammable or combustible liquid fires. At best, water sprinklers will control or extinguish the fire in any associated combustible packaging material. Yet, most of the systems used in the protection criteria tables in Section 6.8 of this code are based on water sprinklers, based on the recognition of the following:

(1) A large spill with small containers is unlikely, although not impossible, provided the sprinklers operate to control cascading breaching of containers.

(2) There is sufficient cooling of larger containers to prevent multiple container breaching.

For large containers, some form of spill containment (e.g., by drainage) is required for protected storage. The intent is to limit the size of the spill and the resulting area of sprinkler operation. There has been little quantification of the appropriate design factors and effectiveness of drainage systems. For example, will protection be provided for a 4000 ft^2 (370 m^2) area that is fully involved in fire? The duration of the fire could influence the effectiveness of such protection.

Foam sprinklers are generally effective on pool (floor) fires but are likely to be ineffective on running, three-dimensional spill fires. Again, total control or extinguishment of the fire cannot be assured.

E.2.6.3 Anticipated Duration of the Fire. For large containers, particularly those greater than 55 gal (208 L) in capacity, there is an inherent assumption that manual fire-fighting efforts will be initiated to finalize control and extinguishment of the fire. For example, foam systems are required to have a duration of 15 minutes. This implies that some action will be taken when the system has been expended. The protection criteria for composite intermediate bulk containers were developed based on a 30-minute fire resistance for the container. Again, action to secure the situation after this time is assumed. The protection criteria for containers greater than 60 gal (225 L) capacity, as outlined in Table 16.5.2.1 through Table 16.5.2.4 and Table 16.5.2.9, provide reasonable containment confidence for a 30-minute fire exposure. Due to the capacity of intermediate bulk containers and portable tanks, it is imperative that response by a private fire brigade or public fire department be capable of initiating fire suppression activities promptly within this period.

Detection, notification, and prompt action by responsible personnel are implicit in the protection criteria. The protection system per se provides thermal detection. In some cases, more rapid detection could be desired. Considerations in evaluating appropriate detection requirements include level of fire department staffing, availability of an on-site fire brigade, and availability of off-site notification by a private service company.

Compliance with local and federal hazardous materials rules and regulations could result in delayed fire department action at the scene of a warehouse fire. Fire departments should also respond to fires in these occupancies with foam fire-fighting equipment to effect final extinguishment. The authority having jurisdiction should assess the capability of the fire department to effectively respond to the incident when implementing the protection criteria in this code. The selection of an approach to fire protection for these occupancies is influenced by the authority having jurisdiction, potential community or environmental exposures, investment at risk, insurance considerations, and business continuity.

E.3 References for Annex E.

See also H.1.3.

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E.4 Bibliography.

Please note that reports by Factory Mutual Research Corporation (FMRC) cited in the bibliography might not be available to the general public. FMRC reports cited in the references are on file at NFPA Headquarters in the NFPA 30 committee files. *(See also Section* H.2.*)*

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Annex F Fugitive Emissions Calculations

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

F.1 Introduction.

An alternative method of providing adequate ventilation for an enclosed area is by making a reasonable estimate of fugitive emissions from hydrocarbon-handling equipment within the enclosed area and providing sufficient diluent ventilation. Application of this method requires certain calculations, and one technique is described in Section F.2.

In calculating the ventilation rate required, the anticipated hydrocarbon leakage rate (under normal conditions) should be determined. Then, sufficient dilution air should be added to the space in question to ensure that the concentration of flammable vapor/gas is maintained below 25 percent of the lower flammable limit (LFL) for all but periods of process upset, abnormal operation, or equipment rupture, or breakdown.

Fugitive emission factors for specific hydrocarbon-handling equipment can be obtained from emission testing at specific facilities or from existing publications. A few existing publications are API's *Fugitive Hydrocarbon Emissions from Petroleum Production Operations*, Volumes I and II, 1980; EPA/Radian Study conducted in 1979; and *EPA Protocols for Generating Unit-Specific Emission Estimates for Equipment Leaks of VOC and HAP*. All emission data used should be reviewed to assure emission rates are representative of actual conditions during normal operations.

F.2 Calculation Technique.

In the following example, the required ventilation rate will be determined for an enclosed area on a cold-weather, offshore platform containing production equipment that measures 60 ft by 120 ft (18 m by 36 m) by 40 ft (12 m) high. The following procedure applies:

(1) List the total applicable hydrocarbon-handling components and their anticipated total hydrocarbon fugitive emissions. The fugitive emissions equipment component leak rates can be obtained from emission measurements at the facility in question, from one of the existing publications listed in Section F.1, or from other studies that are representative of the equipment involved.

(2) The total number of specific components handling hydrocarbons should be obtained by an actual field count for existing equipment or from the design drawings for proposed equipment. Note that components handling gas should be listed separately from those handling liquid hydrocarbons.

(3) Determine the total anticipated gas emission (pounds/day) for each component by multiplying the number of components by the applicable prediction factor. This product is the total gas emission anticipated for that specific type component.

(4) Subtotal the total anticipated gas emissions (pounds/day) for all components to obtain the total gas service emission rate.

(5) Repeat Steps (2) through (4) to determine the hydrocarbon liquids total anticipated emissions.

(6) Add the subtotals from Steps (4) and (5) to determine the total anticipated emissions.

(7) Convert the total hydrocarbon emission from pounds/day to pounds/hour. For the example chosen, assume that the total anticipated hydrocarbon emissions is 297.3 lb/day (135 kg/day). Dividing by 24, the conversion yields 12.4 lb/hr (5.6 kg/hr).

(8) Calculate the average mole weight of the hydrocarbon emissions. An example follows:
83% methane (molecular weight = 16)
13% ethane (molecular weight = 30)

4% butane (molecular weight = 58)
100%
$0.83 \times 16 = 13.28$
$0.13 \times 30 = 3.90$
$0.04 \times 58 = 2.32$
Total = 19.50

To simplify further calculations, the 19.5 is rounded to 20, and 20 is used as the average mole weight of the hydrocarbon emissions mixture.

(9) Calculate the cubic feet/pound-mole at the estimated ambient temperature of the area. This calculation is made utilizing the fact that the volume of 1 pound-mole of an ideal gas is 359 ft^3 (10.2 m^3) at 32°F (0°C) and an absolute pressure of 14.7 psi (101 kPa).

From the Gas law ($PV = nRT$) and Charles' Gas law ($V_1T_2 = V_2T_1$), and from the fact that volume at constant pressure varies proportionately to the ratio of temperatures when the temperature is expressed in degrees Rankine (°F + 460), calculate the actual volume. Assuming an ambient temperature of 88°F (31°C), an example follows.

At 88°F (31°C) and an absolute pressure of 14.7 psi (101 kPa), 359 ft^3 (10 m^3)of ideal gas would occupy:

$$359\left(\frac{460+88}{460+32}\right) \text{ or } 400 \text{ ft}^3$$

(10) Determine the total hydrocarbon leak rate in cubic feet per minute (cfm) using the following equation:

$$G = \frac{(E)(V)}{60\ (mw)}$$

where:

G = leak rate (cfm)
E = emissions rate (lb/hr)
V = volume (ft^3/lb-mole)
60 = min/hr
mw = average mole weight

In our example, E equals 12.39 lb/hr (5.6 kg/hr), and the average mole weight is 20; therefore, G can be calculated as follows:

$$G = \frac{(12.39 \text{ lb/hr})(400 \text{ ft}^3\text{/lb-mole})}{(60 \text{ min/hr})(20)}$$

$$G = 4.13 \text{ cfm}$$

(11) As given in NFPA 69, *Standard on Explosion Prevention Systems*, the hydrocarbon concentration can be

expressed by the following equation:

$$C = \left(\frac{G}{Q}\right)\left(1 - e^{kn}\right)$$

where:

C = concentration of hydrocarbon in air, % expressed as a decimal
G = leak rate (cfm)
Q = fresh air introduction rate (cfm)
e = 2.7183
k = mixing efficiency factor = 0.2 to 0.9
n = number of air changes

The factor ($1 - e^{-kn}$) can be considered equal to 1 because as the number of air changes (n) approaches steady state (i.e., approximately three air changes), this factor approaches unity.

As an example, if the leakage rate is assumed to be 4.13 cfm (0.12 m^3/min), 100 percent LFL methane is assumed (5 percent concentration), and it is desired to maintain a 25 percent LFL mixture, the required fresh air introduction rate can be determined as follows:

$$Q = \frac{4.13 \text{ cfm}}{(0.25 \times 0.05)}$$

$$Q = 330 \text{ cfm}$$

(12) Due to the variations in emission factors for processing equipment, the calculated rate should be multiplied by a safety factor of 4. The required ventilation rate is determined as follows:

$$Q = 330 \text{ cfm} \times 4$$

$$Q = 1320 \text{ cfm, the minimum ventilation rate}$$

Thus, minimum ventilation to achieve adequate ventilation for an enclosed area of the size given in the example that contains the fugitive emissions sources assumed is 1320 cfm (37.4 m^3/min).

(13) Depending on the size of the enclosed area and the equipment configuration, supplemental internal recirculation could be advisable to avoid areas of stagnation. With higher local concentrations where recirculation is justified, it should be designed with adequate air movement and direction to minimize “dead” areas where vapor can collect. If other criteria are lacking, a recirculation rate of 1 cfm/ft^2 (0.3 m^2/min/m^2) of floor area can be used.

(14) If conditions exist where there is a substantial risk of a large flammable vapor release in a confined space and the calculated rate of diluent ventilation is not sufficient to dilute and disperse the released vapor to below the LFL within 4 hours, then supplemental emergency ventilation should be produced. This can be by natural ventilation through panels or louvers, or by switching recirculation fans to full fresh air make-up, or exhaust.

Consideration should be given to the travel direction of ventilated vapor to avoid its reaching an ignition source outside the enclosed space being ventilated.

(15) The preceding procedure is adapted from “Module Ventilation Rates Quantified,” *Oil and Gas Journal*.

Annex G Sample Ordinance Adopting NFPA 30

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

G.1

The following sample ordinance is provided to assist a jurisdiction in the adoption of this code and is not part of this code.

ORDINANCE NO. ____________

An ordinance of the *[jurisdiction]* adopting the *[year]* edition of NFPA *[document number]*, *[complete document title]*, and documents listed in Chapter 2 of that [*code, standard*]; prescribing regulations governing conditions hazardous to life and property from fire or explosion; providing for the issuance of permits and collection of fees; repealing Ordinance No. _______ of the *[jurisdiction]* and all other ordinances and parts of ordinances in conflict therewith; providing a penalty; providing a severability clause; and providing for publication; and providing an effective date.

BE IT ORDAINED BY THE *[governing body]* OF THE *[jurisdiction]*:

SECTION 1 That the *[complete document title]* and documents adopted by Chapter 2, three (3) copies of which are on file and are open to inspection by the public in the office of the *[jurisdiction's keeper of records]* of the *[jurisdiction]*, are hereby adopted and incorporated into this ordinance as fully as if set out at length herein, and from the date on which this ordinance shall take effect, the provisions thereof shall be controlling within the limits of the *[jurisdiction]*. The same are hereby adopted as the [*code, standard*] of the *[jurisdiction]* for the purpose of prescribing regulations governing conditions hazardous to life and property from fire or explosion and providing for issuance of permits and collection of fees.

SECTION 2 Any person who shall violate any provision of this code or standard hereby adopted or fail to comply therewith; or who shall violate or fail to comply with any order made thereunder; or who shall build in violation of any detailed statement of specifications or plans submitted and approved thereunder; or fail to operate in accordance with any certificate or permit issued thereunder; and from which no appeal has been taken; or who shall fail to comply with such an order as affirmed or modified by a court of competent jurisdiction, within the time fixed herein, shall severally for each and every such violation and noncompliance, respectively, be guilty of a misdemeanor, punishable by a fine of not less than $ _____ nor more than $_____ or by imprisonment for not less than ______ days nor more than ______ days or by both such fine and imprisonment. The imposition of one penalty for any violation shall not excuse the violation or permit it to continue; and all such persons shall be required to correct or remedy such violations or defects within a reasonable time; and when not otherwise specified the application of the above penalty shall not be held to prevent the enforced removal of prohibited conditions. Each day that prohibited conditions are maintained shall constitute a separate offense.

SECTION 3 Additions, insertions, and changes — that the *[year]* edition of NFPA *[document number]*, *[complete document title]* is amended and changed in the following respects:

List Amendments

SECTION 4 That ordinance No. _________ of *[jurisdiction]* entitled *[fill in the title of the ordinance or ordinances in effect at the present time]* and all other ordinances or parts of ordinances in conflict herewith are hereby repealed.

SECTION 5 That if any section, subsection, sentence, clause, or phrase of this ordinance is, for any reason, held to be invalid or unconstitutional, such decision shall not affect the validity or constitutionality of the remaining portions of this ordinance. The *[governing body]* hereby declares that it would have passed this ordinance, and each section, subsection, clause, or phrase hereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses, and phrases be declared unconstitutional.

SECTION 6 That the *[jurisdiction's keeper of records]* is hereby ordered and directed to cause this ordinance to be published.

[NOTE: An additional provision may be required to direct the number of times the ordinance is to be published and to specify that it is to be in a newspaper in general circulation. Posting may also be required.]

SECTION 7 That this ordinance and the rules, regulations, provisions, requirements, orders, and matters established and adopted hereby shall take effect and be in full force and effect *[time period]* from and after the date of its final passage and adoption.

Annex H Informational References

H.1 Referenced Publications.

The documents or portions thereof listed in this annex are referenced within the informational sections of this code and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

H.1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 10, *Standard for Portable Fire Extinguishers*, 2007 edition.

NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*, 2005 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2007 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2007 edition.

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, 2007 edition.

NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*, 2007 edition.

NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*, 2007 edition.

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2008 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 1993 edition.

NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products*, 2007 edition.

NFPA 31, *Standard for the Installation of Oil-Burning Equipment*, 2006 edition.

NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*, 2003 edition.

NFPA 58, *Liquefied Petroleum Gas Code*, 2008 edition.

NFPA 68, *Standard on Explosion Protection by Deflagration Venting*, 2007 edition.

NFPA 69, *Standard on Explosion Prevention Systems*, 2008 edition.

NFPA 70, *National Electrical Code®*, 2008 edition.

NFPA 72®, *National Fire Alarm Code®*, 2007 edition.

NFPA 77, *Recommended Practice on Static Electricity*, 2007 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 2002 edition.

NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*, 2004 edition.

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Formal Interpretations

Formal Interpretation

NFPA 30

Flammable and Combustible Liquids Code

2008 Edition

Reference: 1.1, Scope
F.I. 84-4

Background: Tank trailers and semi-trailers are loaded with flammable or combustible liquid and moved to a storage yard. There, the tank vehicles may be kept for days, weeks, or months before being shipped to another location or being moved to another part of the same plant site. Some of the tank vehicles are not road-worthy.

Question: Do such tank vehicles, used for the temporary storage of flammable and combustible liquids, need to meet the requirements of NFPA 30 for drainage, impoundment, separation distances, etc.?

Answer: Yes.

Issue Edition: 1984
Reference: 1-1
Date: April 1987

Formal Interpretation

NFPA 30

Flammable and Combustible Liquids Code

2008 Edition

Reference: 1.1.1, 1.1.2(1)
F.I. 93-1

Question: Since the term "solid" is not defined by NFPA 30, is it the intent of Subsections 1.1.1 and 1.1.2(1) of NFPA 30 that a combustible material, having a melting point at or above 100°F, be outside the scope of NFPA 30 and exempt from NFPA 30's requirements?

Answer: Yes.

Issue Edition: 1993
Reference: 1-1.1, 1-1.3, 5-4.1.1
Issue Date: March 7, 1995
Effective Date: March 27, 1995

Formal Interpretation

NFPA 30

Flammable and Combustible Liquids Code

2008 Edition

Reference: **3.3.5**
F.I. 81-1

Question: Is it the intent of NFPA 30 that Fuel Oil #6 be considered a boil-over liquid, as per the definition of boil-over, viz., crude oil (or certain other liquids) and as per the applicability of Table 22.4.1.4 of NFPA 30 governing boil-over liquids?

Answer: No.

Issue Edition: 1981
Reference: 1-2
Date: April 1981

Formal Interpretation

NFPA 30

Flammable and Combustible Liquids Code

2008 Edition

Reference: Chapter 24
F.I. 90-1

Background: Hydraulic elevator systems commonly use low-pressure tanks as accumulator reservoirs to contain the hydraulic oil that is pumped into and out of the hydraulic cylinder. The question has arisen whether these reservoirs are subject to the provisions of NFPA 30, specifically the provisions of Chapter 24. Specific provisions for such accumulator tanks are not mentioned in any other code, including the ANSI standards that deal specifically with elevator systems.

Question: Are the hydraulic accumulator reservoirs of a hydraulic elevator system subject to the provisions of NFPA 30, Chapter 24, Storage Tank Buildings?

Answer: No.

Issue Edition: 1990
Reference: 2-5
Issue Date: January 22, 1991
Effective Date: February 11, 1991

Formal Interpretation

NFPA 30

Flammable and Combustible Liquids Code

2008 Edition

Reference: 27.6.6
F.I. N/A

Question: Does the requirement for check valves for automatic protection against back-flow in 27.6.6 apply to marine unloading facilities?

Answer: Paragraphs 29.3.9 through 29.3.13 are applicable to marine flammable and combustible liquids wharves at bulk plants and provide exceptions and additions to Chapter 27, including 27.6.6. Use of check valves in tanker and barge unloading lines is not mandatory, but 29.3.11(4) requires the installation of block valves to control flow in the event of physical damage.

Issue Edition: 1976
Reference: 3-6.1
Issue Date: January, 1978
Reissued: January, 1994

Formal Interpretation

NFPA 30

Flammable and Combustible Liquids Code

2008 Edition

Reference: Section 9.4
F.I. 90-2

Background: An intermediate bulk container (IBC), referred to in Section 9.4 of NFPA 30 as a "portable tank," that is constructed of a blow-molded plastic bottle, of 61 to 660 gallons capacity, that is structurally supported by a metal overpack and is attached to a pallet. The plastic overpack provides primary liquid containment. The sheet metal overpack provides structural rigidity and impact protection, but is not liquidtight.

Question: Does a container such as described meet the intent of the phrase "approved metal portable tank" as cited in Section 9.4 of NFPA 30?

Answer: No.

Issue Edition: 1990
Reference: 4-2
Issue Date: January 22, 1991
Effective Date: February 11, 1991

Formal Interpretation

NFPA 30

Flammable and Combustible Liquids Code

2008 Edition

Reference: Table 7.3.3
F. I. No.: 30-03-1

Background: In Table 7.3.3, the electrical area classification for "Office and rest rooms", "Garages for other than tank vehicles", and "Indoor warehousing where there is no flammable liquid transfer" is listed as "Ordinary", i.e., no area classification applies. However, each of these three entries includes a qualifying statement that reads "If there is any opening to these rooms within the extent of an indoor classified location, the room shall be classified the same as if the wall, curb, or partition did not exist"

Question: Is it the intent of the qualifying statement to require that the classified area extend through the opening(s) only to the distance specified by Table 7.3.3 for the specific source(s) that requires area classification?

Answer: Yes.

Issue Edition: 2003
Reference: Table 8.2.2
Issue Date: May 8, 2006
Effective Date: May 28, 2006

Formal Interpretation

NFPA 30

Flammable and Combustible Liquids Code

2008 Edition

Reference: 22.4.2
F.I. No.: 30-08-01

Question No. 1: Does the term "sum of adjacent tank diameters" refer to the diameter of one tank plus the diameter of a single adjacent tank?

Answer: Yes.

Question No. 2: Where there are more than two tanks adjacent to each other, is the "sum of adjacent tank diameters" determined for each pair of tanks, as opposed to adding the diameters of all tanks present?

Answer: Yes.

Issue Edition: 2008
Reference: 22.4.2
Issue Date: December 3, 2007
Effective Date: December 23, 2007

Formal Interpretation

NFPA 30

Flammable and Combustible Liquids Code

2008 Edition

Reference: Table A.16.1.1(b)
F.I. 84-3

Question 1: Does the column in Table A.16.1.1(b), headed "Maximum Quantity of Containers (gal)" apply to the total quantity allowed in a single rack?

Answer: Yes.

Question 2: Does the column in Table A.16.1.1(b), headed "Maximum Quantity of Containers (gal)" also apply to the total quantity allowed in the entire fire area?

Answer: Yes

Issue Edition: 1984
Reference: Table 4-6.1(b)
Date: April 1987
Reissued: August 1995

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NFPA® 30A

Code for

Motor Fuel Dispensing Facilities and Repair Garages

2008 Edition

This edition of NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*, was prepared by the Technical Committee on Automotive and Marine Service Stations. It was issued by the Standards Council on June 4, 2007, with an effective date of June 24, 2007, and supersedes all previous editions.

This edition of NFPA 30A was approved as an American National Standard on June 24, 2007.

Origin and Development of NFPA 30A

This code originated as Chapter 7 of NFPA 30, *Flammable and Combustible Liquids Code*, and was developed by the Technical Committee on Flammable and Combustible Liquids to provide more detailed requirements for vehicle fueling and to anticipate the need to address self-service fueling and alternative fuels. It was first adopted in 1984. The second edition, adopted in 1987, recognized unattended self-service fueling, and a third edition, adopted in 1990, incorporated requirements for lubrication-only service facilities. The fourth edition, adopted in 1993, incorporated several major amendments, the most important of which allowed aboveground fuel storage tanks at retail motor fuel dispensing facilities, based on a Tentative Interim Amendment to the 1990 edition.

The fifth (1996) edition of NFPA 30A included the following significant changes:

(1) An increase in the maximum allowable aboveground fuel storage for Class II liquids (i.e., diesel fuel) at fleet refueling operations to 75,700 L (20,000 gal) per tank, with a maximum aggregate capacity of 302,800 L (80,000 gal)

(2) A new chapter that provided comprehensive fire safety requirements for marine motor fuel dispensing facilities, including fuel dispensing practices

(3) More specific requirements for installation and function of the emergency shear valve at the base of the fuel dispenser

(4) A new section on low melting point piping materials

After the adoption of the 1996 edition of NFPA 30A, the Technical Committee on Automotive and Marine Service Stations was given responsibility for NFPA 88B, *Standard for Repair Garages*, and was also charged with responsibility for developing fire safety requirements for alternative fuels, such as compressed natural gas (CNG), when these fuels are dispensed along with liquid fuels. With respect to repair garages, the technical committee decided to integrate the technical requirements of NFPA 88B into NFPA 30A.

The sixth (2000) edition of NFPA 30A included the following significant changes:

(1) A change in the title of the document to *Code for Motor Fuel Dispensing Facilities and Repair Garages* to more accurately reflect its scope

(2) A complete editorial review to enhance readability and to replace ambiguous text

(3) Revisions to the minimum separation distances for aboveground storage tanks, including minimum separation distances for protected aboveground tanks and tanks in vaults

(4) Addition of basic requirements for protected aboveground tanks

(5) Corrosion protection requirements for tanks and piping

(6) New and more detailed requirements for installation and testing of piping systems, including secondary containment piping

(7) Revisions to the requirements for emergency power disconnects for fuel dispensing systems

(8) Incorporation of requirements for repair garages from NFPA 88B

(9) Addition of a new chapter that set requirements for compressed natural gas (CNG), liquefied natural gas (LNG), and liquefied petroleum gas (LP-Gas)

The 2003 edition of NFPA 30A contained one major revision and several less far-reaching changes. The major revision was the addition of a new chapter, Chapter 13, Farms and Remote Sites, which incorporated the requirements of NFPA 395, *Standard for the Storage of Flammable and Combustible Liquids at Farms and Isolated Sites*. NFPA 395 was withdrawn in 2002.

Other changes included a revision of the definition of fire-resistant tanks in Chapter 3, a change in scope to reflect the incorporation of requirements from NFPA 395, and the addition of material from TIA No. 733 containing requirements and annex material warning people of electrostatic and other hazards that occur during dispensing operations.

The 2008 edition of NFPA 30A contains minor revisions. All technical specifications for tanks have been removed and replaced by references to NFPA 30. References to NFPA 52 have been inserted into Chapter 12 to address storage and dispensing of hydrogen at facilities that dispense gaseous liquid fuels.

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This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on safeguarding against the fire and explosion hazards associated with the general storage, handling, and dispensing of flammable and combustible liquids at automotive and marine service stations, farms, and isolated construction sites and with related activities such as dispensing gaseous fuels.

This committee shall also have primary responsibility for documents on construction, control of fire hazards, ventilation, fire protection, and maintenance of repair garages.

NFPA 30A
Code for
Motor Fuel Dispensing Facilities and Repair Garages
2008 Edition

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

Changes other than editorial are indicated by a vertical rule beside the paragraph, table, or figure in which the change occurred. These rules are included as an aid to the user in identifying changes from the previous edition. Where one or more complete paragraphs have been deleted, the deletion is indicated by a bullet (•) between the paragraphs that remain.

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex D. Editorial changes to extracted material consist of revising references to an appropriate division in this document or the inclusion of the document number with the division number when the reference is to the original document. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex D.

Chapter 1 Administration

1.1* Scope.

1.1.1 This code shall apply to motor fuel dispensing facilities; marine/motor fuel dispensing facilities; and motor fuel dispensing facilities located inside buildings, at fleet vehicle motor fuel facilities, and at farms and isolated construction sites. This code shall also apply to motor vehicle repair garages.

1.1.2* This code shall not apply to those motor fuel dispensing facilities where only liquefied petroleum gas

(LP-Gas), liquefied natural gas (LNG), or compressed natural gas (CNG) is dispensed as motor fuel.

1.2* Purpose.

The purpose of this document shall be to provide reasonable safeguards for dispensing liquid and gaseous motor fuels into the fuel tanks of automotive vehicles and marine craft.

1.3 Application. (Reserved)

1.4 Retroactivity.

The provisions of this code reflect a consensus of what is necessary to provide an acceptable degree of protection from the hazards addressed in this code at the time the code was issued.

1.4.1 Unless otherwise specified, the provisions of this code shall not apply to facilities, equipment, structures, or installations that existed or were approved for construction or installation prior to the effective date of the code. Where specified, the provisions of this code shall be retroactive.

1.4.2 In those cases where the authority having jurisdiction determines that the existing situation presents an unacceptable degree of risk, the authority having jurisdiction shall be permitted to apply retroactively any portions of this code deemed appropriate.

1.4.3 The retroactive requirements of this code shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction, and only where it is clearly evident that a reasonable degree of safety is provided.

1.5 Equivalency.

Nothing in this code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this code.

1.5.1 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.5.2 The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

1.6 Enforcement.

This code shall be administered and enforced by the authority having jurisdiction designated by the governing authority. *(See Annex C for sample wording for enabling legislation.)*

1.7* Classification of Liquids.

Any liquid within the scope of this code and subject to the requirements of this code shall be known generally as either a flammable liquid or a combustible liquid and shall be defined and classified in accordance with this section.

1.7.1 Combustible Liquid. Any liquid that has a closed-cup flash point at or above 100°F (37.8°C). Combustible liquids shall be classified in accordance with 1.7.3.2. [**30:**4.2.2]

1.7.2* Flammable Liquid. Any liquid that has a closed-cup flash point below 100°F (37.8°C) and a Reid vapor pressure that does not exceed an absolute pressure of 40 psi (276 kPa) at 100°F (37.8°C), as determined by ASTM D 323, *Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method)*. Flammable liquids shall be classified in accordance with 1.7.3.1. [**30:**4.2.3]

1.7.3 Classification of Liquids. Any liquid within the scope of this code and subject to the requirements of this code shall be classified in accordance with this section. [**30:**4.3]

1.7.3.1 Flammable liquids shall be classified in accordance with (1), (2), and (3) below. (1) Class IA Liquid — Any liquid that has a flash point below 73°F (22.8°C) and a boiling point below 100°F (37.8°C). (2) Class IB Liquid — Any liquid that has a flash point below 73°F (22.8°C) and a boiling point at or above 100°F (37.8°C). (3) Class IC Liquid — Any liquid that has a flash point at or above 73°F (22.8°C), but below 100°F (37.8°C). [**30:**4.3.1]

1.7.3.2 Combustible liquids shall be classified in accordance with the following: (1) Class II Liquid — Any liquid that has a flash point at or above 100°F (37.8°C) and below 140°F (60°C). (2) Class III Liquid — Any liquid that has a flash point at or above 140°F (60°C) (a) Class IIIA Liquid — Any liquid that has a flash point at or above 140°F (60°C), but below 200°F (93°C). (b) Class IIIB Liquid — Any liquid that has a flash point at or above 200°F (93°C). [**30:**4.3.2]

Chapter 2 Referenced Publications

2.1 General.

The documents or portions thereof listed in this chapter are referenced within this code and shall be considered part of the requirements of this document.

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 10, *Standard for Portable Fire Extinguishers*, 2007 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2007 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2007 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 2008 edition.

NFPA 31, *Standard for the Installation of Oil-Burning Equipment*, 2006 edition.

NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*, 2007 edition.

NFPA 51, *Standard for the Design and Installation of Oxygen–Fuel Gas Systems for Welding, Cutting, and Allied Processes*, 2007 edition.

NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*, 2003 edition.

NFPA 52, *Vehicular Fuel Systems Code*, 2006 edition.

NFPA 54, *National Fuel Gas Code*, 2006 edition.

NFPA 55, *Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks,* 2005 edition.

NFPA 58, *Liquefied Petroleum Gas Code,* 2008 edition.

NFPA 70, *National Electrical Code®*, 2008 edition.

NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, 2007 edition.

NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment,* 2004 edition.

NFPA 85, *Boiler and Combustion Systems Hazards Code,* 2007 edition.

NFPA 86, *Standard for Ovens and Furnaces*, 2007 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems,* 2002 edition.

NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids,* 2004 edition.

NFPA *101®*, *Life Safety Code®,* 2006 edition.

NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances,* 2006 edition.

NFPA 220, *Standard on Types of Building Construction*, 2006 edition.

NFPA 253, *Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source*, 2006 edition.

NFPA 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair,* 2005 edition.

NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids,* 2007 edition.

2.3 Other Publications.

2.3.1 API Publications.

American Petroleum Institute, 1220 L Street, N.W., Washington, DC 20005-4070.

API 607, *Fire Test for Soft-Seated Quarter-Turn Valves*, 4th edition.

2.3.2 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D 5, *Standard Method of Test for Penetration of Bituminous Materials*, 1997.

ASTM D 323, *Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method)*, 1999.

2.3.3 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 87, *Standard for Power-Operated Dispensing Devices for Petroleum Products,* 2001.

UL 842, *Standard for Valves for Flammable Fluids*, 1999.

UL 2080, *Standard for Fire Resistant Tanks for Flammable and Combustible Liquids*, 2000.

UL 2085, *Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids*, 1997, Revised December 1999.

UL 2245, *Standard for Below-Grade Vaults for Flammable Liquid Storage Tanks*, 1999.

2.3.4 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 30, *Flammable and Combustible Liquids Code*, 2008 edition.

NFPA 5000®, *Building Construction and Safety Code®*, 2006 edition.

Chapter 3 Definitions

3.1 General.

The definitions contained in this chapter shall apply to the terms used in this code. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3* Code. A standard that is an extensive compilation of provisions covering broad subject matter or that is suitable for adoption into law independently of other codes and standards.

3.2.4 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.5* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.3 General Definitions.

3.3.1 Basement. Story of a building wholly below grade or partly below and partly above grade, located so that the vertical distance from grade to the floor below is greater than the vertical distance from grade to the floor above. [***5000***, 2006]

3.3.2 Bulk Plant or Terminal. That portion of a property where liquids are received by tank vessel, pipeline, tank car, or tank vehicle and are stored or blended in bulk for the purpose of distributing such liquids by tank vessel, pipeline, tank car, tank vehicle, portable tank, or container.

3.3.3 Closed Container. A container as herein defined, so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

3.3.4 Combustible Liquid. See 3.3.9.1.

3.3.5* Container. Any vessel of 450 L (119 gal) or less capacity used for transporting or storing liquids. [**30,** 2008]

3.3.6* Dispensing Device, Overhead Type. A dispensing device that consists of one or more individual units intended for installation in conjunction with each other, mounted above a dispensing area typically within the service station canopy structure, and characterized by the use of an overhead hose reel.

3.3.7 Flammable Liquid. See 3.3.9.2.

3.3.8 Gas. A material that has a vapor pressure greater than 300 kPa absolute (43.5 psia) at 50°C (122°F) or is completely gaseous at 20°C (68°F) at a standard pressure of 101.3 kPa absolute (14.7 psia).

3.3.9* Liquid. Any material that (1) has a fluidity greater than that of 300 penetration asphalt when tested in accordance with ASTM D 5, *Standard Method of Test for Penetration of Bituminous Materials* or (2) is a viscous substance for which a specific melting point cannot be determined but that is determined to be a liquid in accordance with ASTM D 4359, *Standard Test for Determining Whether a Material is a Liquid or a Solid*. [**30,** 2008]

3.3.9.1* Combustible Liquid. Any liquid that has a closed-cup flash point at or above 100°F (37.8°C), as determined by the test procedures and apparatus set forth in Section 1.7.

3.3.9.2* Flammable Liquid. Any liquid that has a closed-cup flash point below 100°F (37.8°C), as determined by the test procedures and apparatus set forth in Section 1.7.

3.3.9.3 Flammable Liquid Classification.

3.3.9.3.1 Flammable Liquid Class I. Any liquid that has a closed-cup flash point below 100°F (37.8°C) and a Reid vapor pressure not exceeding an absolute pressure of 40 psi (276 kPa) at 100°F (37.8°C), as determined by ASTM D 323, Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method). Flammable liquids are classified according to Section 1.7.

3.3.10 Low Melting Point Materials. Ductile materials such as aluminum, copper, and brass, nonductile materials such as cast iron, and rigid and nonrigid polymeric materials such as plastic and fiberglass-reinforced plastic that soften on exposure to fire and that are partially or completely consumed by fire.

3.3.11 Motor Fuel Dispensing Facility. That portion of a property where motor fuels are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles or marine craft or into approved containers, including all equipment used in connection therewith.

3.3.11.1 Attended Self-Service Motor Fuel Dispensing Facility. A motor fuel dispensing facility that has an attendant or employee on duty whenever the facility is open for business. The attendant or employee on duty does not typically dispense motor fuels into fuel tanks or containers. The customer or vehicle operator usually conducts the dispensing.

3.3.11.2 Fleet Vehicle Motor Fuel Dispensing Facility. A motor fuel dispensing facility at a commercial, industrial, governmental, or manufacturing property where motor fuels are dispensed into the fuel tanks of motor vehicles that are used in connection with the business or operation of that property by persons within the employ of such business or operation.

3.3.11.3 Full-Service Motor Fuel Dispensing Facility. A motor fuel dispensing facility that has one or more attendants or supervisors on duty to dispense motor fuels into fuel tanks or containers whenever the facility is open for business.

3.3.11.4 Marine Motor Fuel Dispensing Facility. A motor fuel dispensing facility at or adjacent to shore, a pier, a wharf, or a floating dock where motor fuels are dispensed into the fuel tanks of marine craft.

3.3.11.5* Motor Fuel Dispensing Facility Located Inside a Building. That portion of a motor fuel dispensing facility located within the perimeter of a building or building structure that also contains other occupancies.

3.3.11.6 Unattended Self-Service Motor Fuel Dispensing Facility. A motor fuel dispensing facility that has no attendant or employee on duty. The customer or vehicle operator conducts the dispensing operation. This includes coin, currency, membership card, and credit card dispensing operations.

3.3.12 Repair Garages.

3.3.12.1 Major Repair Garage. A building or portions of a building where major repairs, such as engine overhauls, painting, body and fender work, and repairs that require draining of the motor vehicle fuel tank are performed on motor vehicles, including associated floor space used for offices, parking, or showrooms.

3.3.12.2 Minor Repair Garage. A building or portions of a building used for lubrication, inspection, and minor automotive maintenance work, such as engine tune-ups, replacement of parts, fluid changes (e.g., oil, antifreeze, transmission fluid, brake fluid, air conditioning refrigerants, etc.), brake system repairs, tire rotation, and similar routine maintenance work, including associated floor space used for offices, parking, or showrooms.

3.3.13 Safety Can. A listed container, of not more than 20 L (5.3 gal) capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

3.3.14 Submersible Pump. A pump that is located inside a storage tank and positioned near the bottom of the tank, below the liquid level.

3.3.15 Tanks.

3.3.15.1 Aboveground Storage Tank. A horizontal or vertical tank that is listed and intended for fixed installation, without backfill, above or below grade and is used within the scope of its approval or listing.

3.3.15.2 Fire-Resistant Tank. An atmospheric aboveground storage tank with thermal insulation that has been evaluated for resistance to physical damage and for limiting the heat transferred to the primary tank when exposed to a hydrocarbon pool fire and is listed in accordance with UL 2080, *Standard for Fire Resistant Tanks for Flammable and Combustible Liquids*, or an equivalent test procedure. [**30**, 2008]

3.3.15.3 Portable Tank. Any vessel having a liquid capacity over 60 gal (230 L) intended for storing liquids and not intended for fixed installation. [**30**, 2008]

3.3.15.4* Protected Aboveground Tank. An atmospheric aboveground storage tank with integral secondary containment and thermal insulation that has been evaluated for resistance to physical damage and for limiting the heat transferred to the primary tank when exposed to a hydrocarbon pool fire and is listed in accordance with ANSI/UL 2085, *Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids*, or an equivalent test procedure. [**30,** 2008]

3.3.16 Vapor Processing Equipment. Those components of a vapor processing system designed to process vapors or liquids captured during transfer or filling operations. [**30,** 2008]

3.3.17* Vapor Processing System. A system designed to capture and process vapors displaced during transfer or filling operations by use of mechanical or chemical means. [**30,** 2008]

3.3.18* Vapor Recovery System. A system designed to capture and retain, without processing, vapors displaced during transfer or filling operations.

Chapter 4 Storage of Liquids

4.1 Scope.

This chapter shall apply to the storage of liquid fuels and to the storage of related materials, such as lubricating oils and greases, cleaning solvents, and windshield washer solvents.

4.2 General Requirements.

4.2.1 Liquids shall be stored in the following:

(1) Approved closed containers that do not exceed 227 L (60 gal) capacity and are located outside buildings

(2) Tanks or approved closed containers located inside motor fuel dispensing facilities or repair garages

(3) Aboveground tanks, underground tanks, and containers in accordance with the requirements of Section 4.3

(4) Tanks supplying marine service stations in accordance with Section 11.2

4.2.2 A motor fuel dispensing facility located at a bulk plant shall be separated from areas in which bulk plant operations are conducted by a fence or other approved barrier. Dispensing devices at the motor fuel dispensing facility shall not be supplied by aboveground tanks located in the bulk plant. Storage tanks at motor fuel dispensing facilities shall not be connected by piping to aboveground tanks located in the bulk plant.

4.2.3 Class I liquids shall not be stored or handled in a building that has a basement or pit into which ignitible vapors can travel, unless the basement or pit is provided with ventilation that will prevent the accumulation of vapors. The ventilation system shall be capable of providing at least 1 ft^3/min of exhaust per ft^2 of floor area (0.3 $m^3/min/m^2$), but not less than 4 m^3/min (150 ft^3/min).

4.2.4 Where tanks are at an elevation that produces a gravity head on the dispensing device, the tank outlet shall be equipped with a device, such as a normally closed solenoid valve, positioned adjacent to and downstream from the valve specified in 4.3.2.5.1 of NFPA 30, *Flammable and Combustible Liquids Code*, that is installed and adjusted so that liquid cannot flow by gravity from the tank if the piping or hose fails when the dispenser is not in use.

4.3 Storage of Liquids.

4.3.1 Underground Tanks. Underground storage tanks shall meet all applicable requirements of Chapters 21 through 23 and 27 of NFPA 30, *Flammable and Combustible Liquids Code*.

4.3.2* Aboveground Storage Tanks. Except as modified by the provisions of this subsection, aboveground storage tanks shall meet all applicable requirements of Chapters 21 through 23 and 27 of NFPA 30, *Flammable and Combustible Liquids Code*.

4.3.2.1 The use of aboveground storage tanks at motor fuel dispensing facilities, fleet vehicle motor fuel dispensing facilities, and marine motor fuel dispensing facilities shall be permitted when installed in accordance with the requirements of this subsection and with all applicable requirements of Chapters 21 through 23 and 27 of NFPA 30, *Flammable and Combustible Liquids Code*, and, for tanks other than tanks in vaults, when the specific installation has been approved by the authority having jurisdiction.

4.3.2.2 Tanks designed and built for underground use shall not be installed for aboveground use.

4.3.2.3 Tanks storing Class I and Class II liquids at an individual site shall be limited to a maximum individual capacity of 45,400 L (12,000 gal) and aggregate capacity of 181,700 L (48,000 gal) unless such tanks are installed in vaults complying with 4.3.3, in which case the maximum individual capacity shall be permitted to be 57,000 L (15,000 gal).

4.3.2.4 Tanks shall be located in accordance with Table 4.3.2.4.

Table 4.3.2.4 Minimum Separation Requirements for Aboveground Tanks

		Minimum Distance (ft)				
Tank Type	**Individual Tank Capacity (gal) [a]**	**From the Nearest Important Building on the Same Property**	**From Nearest Fuel Dispensing Device[b]**	**From Lot Line That Is or Can Be Built Upon[c]**	**From the Nearest Side of Any Public Way**	**Between Tanks**
Tanks in vaults[d]	0–15,000	0	0	0	0	Separate compartment s required for each tank
Protected aboveground tanks	Less than or equal to 6,000	5	0	15	5	3
	6,001–12,000	15	0	25	15	3
Fire-resistant tanks	0–12,000	25	25	50	25	3

Table 4.3.2.4 Minimum Separation Requirements for Aboveground Tanks

Tank Type	Individual Tank Capacity (gal) [a]	Minimum Distance (ft): From the Nearest Important Building on the Same Property	From Nearest Fuel Dispensing Device[b]	From Lot Line That Is or Can Be Built Upon[c]	From the Nearest Side of Any Public Way	Between Tanks
Other tanks meeting the requirements of NFPA 30	0–12,000	50	50	100	50	3

For SI units, 1 ft = 0.30 m; 1 gal = 3.8 L.

[a]See 4.3.2.3 and 4.3.2.5.

[b]See 4.3.2.6.

[c]Including the opposite side of a public way.

[d]The separation distances given for vaults are measured from the outer perimeter of the vault.

4.3.2.5 The maximum individual tank capacity of 45,400 L (12,000 gal), where indicated in Table 4.3.2.4, shall be permitted to be increased to 75,700 L (20,000 gal) for Class II and Class III liquids at a fleet vehicle motor fuel dispensing facility and an aggregate capacity of 304,000 L (80,000 gal).

4.3.2.6 At fleet vehicle motor fuel dispensing facilities, no minimum separation shall be required between the dispensing device and a tank in a vault, a protected aboveground tank, or a fire-resistant tank.

4.3.2.7 The provisions of this subsection shall not prohibit the dispensing of Class I and Class II liquids in the open from a fuel dispensing system supplied by an existing aboveground tank, not to exceed 22,710 L (6000 gal), located at commercial, industrial, government, or manufacturing establishments, and intended for fueling vehicles used in connection with their business. Such dispensing shall be permitted provided the following conditions are met:

(1) An inspection of the premises and operations has been made and approval has been granted by the authority having jurisdiction.

(2) The tank is safeguarded against collision, spillage, and overfill to the satisfaction of the authority having jurisdiction.

(3) The tank system is listed or approved for such aboveground use.

(4) The tank complies with requirements for emergency relief venting, the tank and dispensing system meet the electrical classification requirements of this code, and the tank complies with the provisions of 4.2.4.

(5) The tank storage complies with Chapter 22 of NFPA 30, *Flammable and Combustible Liquids Code*.

4.3.2.8 Aboveground tanks shall be provided with spill control that meets the requirements of 2.1.7.1 of NFPA 30, *Flammable and Combustible Liquids Code*. Tank fill connections shall be provided with a noncombustible spill containment device.

Exception: Tanks installed in vaults that meet the requirements of 4.3.3 need not meet this requirement.

4.3.3 Vaults for Aboveground Tanks.

4.3.3.1 Scope. Subsection 4.3.3 shall apply to installation of aboveground tanks in vaults and design and installation of such vaults.

4.3.3.2 General. Aboveground tanks shall be permitted to be installed in vaults that meet the requirements of 4.3.3. Except as modified by the provisions of 4.3.3, vaults shall meet all other applicable provisions of NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*. Vaults shall be constructed and listed in accordance with UL 2245, *Standard for Below-Grade Vaults for Flammable Liquid Storage Tanks*. Vaults shall be permitted to be either above or below grade.

4.3.3.3* Construction and Installation of Storage Tank Vaults. [30:25.5]

4.3.3.3.1 Construction Requirements. Vaults shall be designed and constructed in accordance with 4.3.3.3.1.1 through 4.3.3.3.1.4. [**30:**25.5.1]

4.3.3.3.1.1 The top of an abovegrade vault that contains a tank storing Class I liquid or Class II liquid stored at a temperature above its flash point shall be constructed of noncombustible material and shall be designed to be weaker than the walls of the vault to ensure that the thrust of any explosion occurring inside the vault is directed upward before destructive internal pressure develops within the vault. [**30:**25.5.1.1]

4.3.3.3.1.2 The top of an at-grade or belowgrade vault that contains a tank storing Class I liquid or Class II liquid stored at a temperature above its flash point shall be designed to relieve or contain the force of any explosion occurring inside the vault. [**30:**25.5.1.2]

4.3.3.3.1.3 Adjacent vaults shall be permitted to share a common wall. [**30:**25.5.1.3]

4.3.3.3.1.4 Where required, the vault shall be wind and earthquake resistant, in accordance with recognized engineering standards. [**30:**25.5.1.4]

4.3.3.3.2 Installation Requirements. Storage tank vaults shall be installed in accordance with the requirements of 4.3.3.3.2.1 and 4.3.3.3.2.2. [**30:**25.5.2]

4.3.3.3.2.1 Each vault and its tank shall be anchored to resist uplifting by groundwater or flooding, including when the tank is empty. [**30:**25.5.2.1]

4.3.3.3.2.2 Vaults that are not resistant to damage from the impact of a motor vehicle shall be protected by collision barriers. [**30:**25.5.2.2]

4.3.3.4 Tank Selection and Arrangement.

4.3.3.4.1 Tanks shall be listed for aboveground use.

4.3.3.4.2 Each tank shall be in its own vault and shall be completely enclosed by the vault. [**30:**25.3.1.5]

4.3.3.4.3 Sufficient clearance between the tank and the vault shall be provided to allow for visual inspection and maintenance of the tank and its appurtenances. [**30:**25.3.1.6]

4.3.3.4.4 Backfill shall not be permitted around the tank. [**30:**25.3.1.7]

4.3.3.5 Tank Appurtenances.

4.3.3.5.1 Vent pipes that are provided for normal tank venting shall terminate outside the vault and at least 3.6 m (12 ft) above ground level and shall meet the requirements of 25.13 of NFPA 30, *Flammable and Combustible Liquids Code*.

4.3.3.5.2 Emergency vents shall be vaportight and shall be permitted to discharge inside the vault. Long-bolt manhole covers shall not be permitted for this purpose.

4.3.3.5.3 An approved means of overfill protection shall be provided for tanks. The use of ball float valves shall be prohibited.

4.3.3.5.4 Fill connections for vaults installed inside buildings shall comply with 21.13.4 of NFPA 30, *Flammable and Combustible Liquids Code*.

4.3.3.6 Exhaust Ventilation Systems. Vaults that contain tanks storing Class I liquids shall be ventilated at a rate of not less than 0.3 m^3/min per m^2 of floor area (1 ft^3/min/ft^2), but not less than 4 m^3/min (150 ft^3/min). Such ventilation shall operate continuously or shall be designed to operate upon activation of a vapor and liquid detection system. Failure of the exhaust airflow shall automatically shut down the dispensing system. The exhaust system shall be designed to provide air movement across all parts of the vault floor. Supply and exhaust ducts shall extend to within 75 mm (3 in.), but not more than 300 mm (12 in.), of the floor. The exhaust system shall be installed in accordance with the provisions of NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*. [**30:**25.10]

4.3.3.7 Vapor and Liquid Detection Systems.

4.3.3.7.1 Vaults shall be provided with approved vapor and liquid detection system and equipped with on-site audible and visual warning devices with battery back-up. [**30:**25.15.1]

4.3.3.7.2 The vapor detection system shall sound an alarm when the system detects vapors that reach or exceed 25 percent of the lower flammable limit of the liquid stored. [**30:**25.15.2]

4.3.3.7.3 Vapor detectors shall be located no higher than 300 mm (12 in.) above the lowest point in the vault. [**30:**25.15.3]

4.3.3.7.4 The liquid detection systems shall sound an alarm upon detection of any liquid, including water. [**30:**25.15.4]

4.3.3.7.5 Liquid detectors shall be located in accordance with the manufacturer's instructions. [**30:**25.15.5]

4.3.3.7.6 Activation of either vapor detection system or liquid detection system shall cause a signal to be sounded at an approved, constantly attended location within the facility serving the tanks or at an approved location. [**30:**25.15.6]

4.3.3.8 In lieu of the separation distance requirements given in 4.3.2.1.1 of NFPA 30, *Flammable and Combustible Liquids Code*, separation distances between the vault and any of the following shall be permitted to be reduced to 0 m (0 ft), as measured from the outer perimeter of the vault wall:

(1) Any property line that is or can be built upon

(2) The near and far sides of a public way

(3) The nearest important building on the same property [**30:**25.4]

4.3.3.9 Vaults and their required equipment shall be maintained in accordance with the construction requirements of 4.3.3. [**30:**25.16]

4.3.4 Fire-Resistant Tanks. Fire resistant tanks shall be tested and listed in accordance with UL 2080, *Standard for Fire Resistant Tanks for Flammable and Combustible Liquids.* Fire resistant tanks shall also meet both of the following requirements:

(1) The construction that provides the required fire resistive protection shall reduce the heat transferred to the primary tank in order to limit the temperature of the primary tank to an average maximum rise of 800°F (430°C) and a single point maximum rise of 1000°F (540°C) and to prevent release of liquid, failure of the primary tank, failure of the supporting structure, and impairment of venting for a period of not less than 2 hours when tested using the fire exposure specified in UL 2080.

(2) Reduction in sizing of the emergency vents in accordance with 22.7.3.5 of NFPA 30, *Flammable and Combustible Liquids Code*, shall not be permitted. [**30:**22.10.2]

4.3.5 Protected Tanks. Protected aboveground tanks shall be tested and listed in accordance with UL 2085, *Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids.* [**30:**22.10.1]

4.3.5.1 Protected tanks shall also meet both of the following requirements:

(1) The construction that provides the required fire resistive protection shall reduce the heat transferred to the primary tank in order to limit the temperature of the primary tank to an average maximum rise of 260°F (144°C) and a single point maximum rise of 400°F (204°C) and to prevent release of liquid, failure of the primary tank, failure of the supporting structure, and impairment of venting for a period of not less than 2 hours when tested using the fire exposure specified in UL 2085.

(2) Reduction in sizing of the emergency vents in accordance with 22.7.3.5 of NFPA 30, *Flammable and Combustible Liquids Code*, shall not be permitted. [**30:**22.10.2]

4.3.6 Additional Requirements for All Aboveground Tanks.

4.3.6.1 All openings shall be located above the maximum liquid level.

4.3.6.2 Means shall be provided for determining the liquid level in each tank, and this means shall be accessible to the delivery operator.

4.3.6.3 Means shall be provided to sound an audible alarm when the liquid level in the tank reaches 90 percent of capacity. Means shall also be provided either to automatically stop the flow of liquid into the tank when the liquid level in the tank reaches 98 percent capacity or to restrict the flow of liquid into the tank to a maximum flow rate of 9.5 L/min (2.5 gpm) when the liquid in the tank reaches 95 percent capacity. These provisions shall not restrict or interfere with the operation of either the normal vent or the emergency vent.

4.3.6.4 Means shall be provided to prevent the release of liquid by siphon flow.

4.3.6.5 Shutoff and check valves shall be equipped with a pressure-relieving device that will relieve the pressure generated by thermal expansion back to the tank.

4.3.6.6 Fuel shall not be dispensed from the tank by either gravity flow or pressurization of the tank.

4.3.7 Physical Protection for All Outside Aboveground Tanks.

4.3.7.1 Tanks that are not enclosed in vaults shall be enclosed with a chain link fence at least 1.8 m (6 ft) high. The fence shall be separated from the tanks by at least 3 m (10 ft) and shall have a gate that is secured against unauthorized entry.

Exception: Tanks are not required to be enclosed with a fence if the property on which the tanks are located has a perimeter security fence.

4.3.7.2* Guard posts or other approved means shall be provided to protect tanks that are subject to vehicular damage. When guard posts are installed, the following design shall be acceptable:

(1) They shall be constructed of steel not less than 100 mm (4 in.) in diameter and shall be filled with concrete.

(2) They shall be spaced not more than 1.2 m (4 ft) on center.

(3) They shall be set not less than 0.9 m (3 ft) deep in a concrete footing of not less than 380 mm (15 in.) diameter.

4.3.8* Corrosion Control. Any portion of a tank or its piping that is in contact with the soil shall have properly engineered, installed, and maintained corrosion protection that meets the requirements of 21.4.5 of NFPA 30, *Flammable and Combustible Liquids Code*.

4.3.9 Storage of Liquids Inside Buildings. Storage of flammable and combustible liquids in motor fuel dispensing facility buildings and in repair garage buildings shall meet the requirements of this subsection.

4.3.9.1 Class I, II, and IIIA Liquids in Tanks Not Exceeding 454 L (120 Gal) Capacity and in Containers.

4.3.9.1.1 The aggregate quantity of Class I liquids stored in a tank that does not exceed 454 L (120 gal) capacity and in containers shall not exceed 454 L (120 gal). Liquids in storage shall be maintained in tanks or in approved containers that are closed or are fitted with an approved dispensing device that meets the requirements of 9.2.4.1.

4.3.9.1.2 Except as permitted under 4.3.9.1.3, the aggregate quantity of Class II and Class IIIA liquids stored in a tank that does not exceed 454 L (120 gal) capacity and in containers shall not exceed 908 L (240 gal). The quantity for each class shall not exceed 454 L (120 gal). Liquids in storage shall be maintained in tanks or in approved containers that are closed or are fitted with an approved dispensing device that meets the requirements of 9.2.4.1.

4.3.9.1.3 Where there are no Class I liquids stored, the aggregate quantities of Class II liquids shall not exceed 908 L (240 gal).

4.3.9.2 Class I, II, and IIIA Liquids in Tanks Exceeding 454 L (120 Gal) Capacity. Where installation of a tank that exceeds 454 L (120 gal) capacity in accordance with 4.3.2 is not practical because of building or property limitations, the tank shall be permitted to be installed in a building if it is enclosed as described in 4.3.3 and if the installation is specifically approved by the authority having jurisdiction.

4.3.9.3 Class IIIB Liquids. The quantity of Class IIIB liquids in storage shall not be limited. Class IIIB liquids shall be permitted to be stored in and dispensed from tanks and containers that meet the requirements of Chapter 9 and

Chapters 21 through 23 of NFPA 30, *Flammable and Combustible Liquids Code*, as applicable. Tanks storing Class IIIB liquids inside buildings shall be permitted to be located at, below, or above grade. Adequate drainage shall be provided. Tanks and containers that contain only crankcase drainings shall be considered as containing Class IIIB liquids.

4.3.10 Temporary Storage of Liquid Fuels. Aboveground tanks used for dispensing of motor fuels shall not be required to be permanently installed when located on premises not normally accessible to the public provided that all of the following requirements are met:

(1) Approval of the authority having jurisdiction shall be required prior to bringing the tank to a site in the jurisdiction. In reviewing a proposed installation, the condition of the tank, the site where the tank will be located, installation and testing procedures, and operational procedures shall be evaluated prior to approval.

(2) The approval shall include a definite time limit after which the tank shall be removed from the site and relocated to an approved location.

(3) The tank shall comply with Section 4.3 and all other applicable provisions of this code and NFPA 30, *Flammable and Combustible Liquids Code*.

(4) A tank containing liquid shall not be moved unless it has been specifically investigated and approved for movement while full or partially full.

Chapter 5 Piping for Liquids

5.1 Scope.

This chapter shall apply to piping systems consisting of pipe, tubing, flanges, bolting, gaskets, valves, fittings, flexible connectors, the pressure-containing parts of other components such as expansion joints and strainers, and devices that serve such purposes as mixing, separating, snubbing, distributing, metering, controlling flow, or secondary containment of liquids and associated vapors.

5.2 General Requirements for All Piping Systems.

5.2.1 The design, fabrication, assembly, test, and inspection of the piping system shall meet the requirements of Chapter 27 of NFPA 30, *Flammable and Combustible Liquids Code*.

Exception No. 1: Where dispensing is from a floating structure or pier, approved oil-resistant flexible hose shall be permitted to be used between shore piping and the piping on the floating structure or pier and between separate sections of the floating structure to accommodate changes in water level or shoreline, provided that the hose is either resistant to or shielded from damage by fire.

Exception No. 2: Low melting point rigid piping shall be permitted to be used between underground shore piping and a floating structure or pier and on the floating structure or pier itself, provided that the piping is protected from physical damage and stresses arising from impact, settlement, vibration, expansion, contraction, or tidal action and provided that the hose is either resistant to or shielded from damage by fire exposure.

5.2.2 Piping shall be located so that it is protected from physical damage. Piping that passes through a dike wall shall be designed to prevent excessive stresses that could result from settlement or fire exposure.

5.2.3 Any portion of a piping system that is in contact with the soil shall be protected from corrosion in accordance with good engineering practice.

5.2.4 All piping inside buildings but outside the motor fuel dispensing area shall be enclosed within a horizontal chase or a vertical shaft used only for this piping. Vertical shafts and horizontal chases shall be constructed of materials having a fire resistance rating of not less than 2 hours.

5.2.5 Each fill pipe shall be identified by color code or other marking to identify the product for which it is used. The color code or marking shall be maintained in legible condition throughout the life of the installation.

5.2.6 Shutoff and check valves shall be equipped with a pressure-relieving device that will relieve any pressure generated by thermal expansion of the contained liquid back to the storage tank.

5.2.7 Piping components made of low melting point materials shall be permitted to be used without backfill with the following sumps:

(1) Belowgrade underground tank sumps that are fitted with a cover

(2) Belowgrade piping connection sumps that are fitted with a cover

(3) Containment sumps, under the following conditions:

  (a) The sump is monitored to detect any leaks.

  (b) Any leaks can be controlled.

  (c) The components are either resistant to or shielded from damage by fire exposure.

(4) Containment sumps, provided the piping components can successfully pass the test procedures described in API 607, *Fire Test for Soft-Seated Quarter-Turn Valves*

5.3 Installation of Piping Systems.

Piping shall be installed in accordance with the manufacturers' instructions.

5.3.1 Bends. The bending radius for piping and tubing that is bent shall not be less than recommended by the manufacturer.

5.3.2 Flexible Connections.

5.3.2.1 Flexible piping connections shall be provided at the following points in the piping system:

(1) Where liquid, vapor return, and vent piping connects to underground tanks

(2) At the base of any vent riser

(3) Where required to relieve stress at points where the piping changes direction

5.3.2.2 Acceptable means for providing flexibility in piping systems shall include the following:

(1) Listed flexible connectors that are approved for the purpose

(2) Piping that is inherently flexible and is approved for the purpose

(3) Other means acceptable to the piping manufacturer

5.3.3 Fiberglass-Reinforced Plastic Piping. Fiberglass-reinforced plastic (FRP) piping shall not be required to have flexible joints if both of the following conditions exist:

(1) The piping does not exceed 100 mm (4 in.) in diameter.

(2) The piping has a straight run of not less than 1220 mm (4 ft) on one side of the connection when the connection results in a change of direction.

5.4 Testing.

5.4.1 General. All piping and secondary containment piping shall be tested before being covered, enclosed, or placed in service in accordance with the requirements of Section 27.7 of NFPA 30, *Flammable and Combustible Liquids Code*.

5.4.2* Secondary Containment Piping. In addition to the test required in 5.4.1, secondary containment–type piping shall have the interstitial space (annulus) tested hydrostatically or with air pressure at minimum gauge pressure of 34.5 kPa (5 psi) or shall be tested in accordance with the listing or the manufacturers' instructions. The pressure source shall be closed from the system being tested to ensure that the test is being conducted on a closed system.

5.4.3 Maintenance Testing. Existing piping shall be tested in accordance with 5.4.1 when the authority having jurisdiction has reasonable cause to believe that a leak exists. Piping that could contain flammable or combustible liquids shall not be tested pneumatically. Such tests shall be at the expense of the owner or operator.

5.4.4 Leak Detection. On remote pressure pumping systems, each pump shall have installed, on the discharge side, a listed leak detection device that will provide an audible or visible indication if the piping and dispensing devices are not liquidtight.

5.5 Detector Maintenance.

Each leak-detecting device shall be checked and tested at least annually according to the manufacturers' specifications to ensure proper installation and operation.

5.6 Vent Piping.

5.6.1 Vent piping shall meet the requirements of 27.8.2.1, 27.8.2.2, 27.8.2.3, and 27.8.2.6 of NFPA 30, *Flammable and Combustible Liquids Code*.

5.6.2 Vent pipes for all tanks storing Class I liquids shall discharge only in an upward direction in order to disperse vapors and shall terminate at least 3.6 m (12 ft) above grade.

5.6.3 Tank vents that are installed within or attached to a canopy shall extend a minimum of 1.5 m (5 ft) above the highest projection of the canopy.

5.7 Vapor Recovery Piping.

A vapor return pipe inside the dispenser housing shall have a shear section or flexible connector so that the liquid emergency shutoff valve will function as described in 6.3.9.

Chapter 6 Fuel Dispensing Systems

6.1 Scope.

This chapter shall apply to the system and components that dispense fuel into the tanks of motor vehicles and marine craft.

6.2 General Requirements.

6.2.1 Dispensing devices installed outside at motor fuel dispensing stations shall be located as follows:

(1) Ten feet or more from property lines

(2) Ten feet or more from buildings, other than canopies, having combustible exterior wall surfaces or buildings having noncombustible exterior wall surfaces that are not a part of a one-hour fire-resistive assembly

(3) Such that all parts of the vehicle being served will be on the premises of the service station

(4) Such that the nozzle, when the hose is fully extended, will not reach within 1.5 m (5 ft) of building openings

6.2.2 Liquids shall not be dispensed by applying pressure to drums, barrels, and similar containers. Listed pumps taking suction through the top of the container or listed self-closing faucets shall be used.

6.3 Requirements for Dispensing Devices.

6.3.1 Class I and Class II liquids shall be transferred from tanks by means of fixed pumps designed and equipped to allow control of the flow and prevent leakage or accidental discharge.

6.3.2 Dispensing devices for Class I and II liquids shall be listed.

6.3.2.1 Existing listed or labeled dispensing devices shall be permitted to be modified provided that the modifications made are “Listed by Report” by an approved testing laboratory or as otherwise approved by the authority having jurisdiction. Modification proposals shall contain a description of the component parts used in the modification and the recommended methods of installation on specific dispensing devices. Modification proposals shall be made available to the authority having jurisdiction upon request.

6.3.3 A control shall be provided that will permit the pump to operate only when a dispensing nozzle is removed from its bracket or normal position with respect to the dispensing device and the switch on this dispensing device is manually actuated. This control shall also stop the pump when all nozzles have been returned to their brackets or to their normal nondispensing position.

6.3.4 Dispensing devices shall be mounted on a concrete island or shall otherwise be protected against collision damage by means acceptable to the authority having jurisdiction. Dispensing devices shall be securely bolted in place. If located indoors, dispensing devices shall also be located in a position where they cannot be struck by a vehicle that is out of control descending a ramp or other slope. Dispensing devices shall be installed in accordance with the manufacturers' instructions.

6.3.5 Dispensing devices used to fill portable containers with home heating fuels shall be located at least 6 m (20 ft) from any dispensing devices for motor fuels.

6.3.6 When maintenance to dispensing devices is necessary and such maintenance is capable of causing accidental release or ignition of liquid, the following precautions shall be taken before such maintenance is begun:

(1) Only persons knowledgeable in performing the required maintenance shall perform the work.

(2) All electrical power to the dispensing devices, to the pump serving the dispensing devices, and to all associated control circuits shall be shut off at the main electrical disconnect panel.

(3) The emergency shutoff valve at the dispenser, if installed, shall be closed.

(4) All vehicular traffic and unauthorized persons shall be prevented from coming within 6 m (20 ft) of the dispensing device.

6.3.7 Motor vehicle traffic patterns at motor fuel dispensing facilities shall be designed to inhibit movement of vehicles that are not being fueled from passing through the dispensing area.

6.3.8 At unattended self-serve motor fuel dispensing facilities, coin- and currency-type devices shall only be permitted with the approval of the authority having jurisdiction.

6.3.9 Where liquid is supplied to the dispensing device under pressure, a listed, rigidly anchored emergency shutoff valve incorporating a fusible link or other thermally actuated device, designed to close automatically in event of severe impact or fire exposure, shall be installed in the supply line at the base of each individual island-type dispenser or at the inlet of each overhead dispensing device. The emergency shutoff valve shall be installed in accordance with the manufacturers' instructions. The emergency shutoff valve shall not incorporate a slip-joint feature.

Exception: As provided for in 6.3.10.

6.3.9.1 The automatic-closing feature of this valve shall be tested at the time of installation and at least once a year thereafter by manually tripping the hold-open linkage. Records of such tests shall be kept at the premises or shall be made available for inspection by the authority having jurisdiction within 24 hours of a verbal or written request.

6.3.10 Where a suction-type dispensing system includes a booster pump or where a suction-type dispensing system is supplied by a tank in a manner that produces a gravity head on the dispensing device, a listed, vacuum-actuated shutoff valve with a shear section or equivalent-type valve shall be installed directly under the dispensing device.

6.4 Requirements for Remote/Submersible Pumps.

This section shall apply to systems for dispensing Class I and Class II liquids where the liquids are transferred from storage to individual or multiple dispensing devices by pumps located other than at the dispensing devices.

6.4.1 Pumps shall be listed and shall be designed or equipped so that no part of the system will be subjected to pressures above its allowable working pressure.

6.4.2 Each pump shall have installed on the discharge side a listed leak detection device that will provide an audible or visible indication if the piping or a dispenser is leaking. Each leak-detecting device shall be checked and tested at least annually according to the manufacturers' specifications to ensure proper installation and operation.

Exception: A leak detection device shall not be required if all piping is visible.

6.4.3 Pumps installed above grade outside of buildings shall be located not less than 3 m (10 ft) from lines of adjoining property that can be built upon and not less than 1.5 m (5 ft) from any building opening. Where an outside pump location is impractical, pumps shall be permitted to be installed inside buildings as provided for dispensers in 6.3.4 or in sumps as provided in 6.4.4. Pumps shall be anchored and protected against physical damage.

6.4.4 Sumps for subsurface pumps or piping manifolds of submersible pumps shall withstand the external forces to which they can be subjected without damage to the pump, tank, or piping. The sump shall be no larger than necessary for inspection and maintenance and shall be provided with a fitted cover.

6.5 Requirements for Dispensing Hose.

6.5.1 Listed hose assemblies shall be used to dispense fuel. Hose length at automotive motor fuel dispensing facilities shall not exceed 5.5 m (18 ft). Where hose length at marine motor fuel dispensing facilities exceeds 5.5 m (18 ft), the hose shall be secured so as to protect it from damage.

6.5.2 A listed emergency breakaway device designed to retain liquid on both sides of the breakaway point shall be installed on each hose dispensing Class I and II liquids. Such devices shall be installed and maintained in accordance with the manufacturers' instructions.

6.5.3 Where hose are attached to a hose-retrieving mechanism, the listed emergency breakaway device shall be installed between the point of attachment of the hose-retrieving mechanism to the hose and the hose nozzle valve.

Exception: Such devices shall not be required at marine motor fuel dispensing facilities.

6.6 Requirements for Fuel Delivery Nozzles.

6.6.1 An automatic-closing-type hose nozzle valve, listed in accordance with UL 842, *Standard for Valves for Flammable Fluids*, with or without latch-open device, shall be provided on island-type dispensing devices used to dispense Class I or Class II liquids.

6.6.2* At any installation where the normal flow of product may be stopped other than by the hose nozzle valve, the system shall include listed equipment with a feature that causes or requires the closing of the hose nozzle valve before product flow can be resumed or before the hose nozzle valve can be replaced in its normal position in the dispenser.

6.6.3 Overhead-type dispensing devices shall be provided with a listed, automatic-closing-type hose nozzle valve without a latch-open device.

Exception: A listed, automatic-closing-type hose nozzle valve with latch-open device shall be permitted to be used if the hose nozzle valve will close automatically in the event the valve is released from a fill opening or upon impact.

6.6.4 Dispensing nozzles used at marine motor fuel dispensing facilities shall be of the automatic-closing type without a latch-open device.

6.7 Emergency Electrical Disconnects.

Fuel dispensing systems shall be provided with one or more clearly identified emergency shutoff devices or electrical disconnects. Such devices or disconnects shall be installed in approved locations but not less than 6 m (20 ft) or more than 30 m (100 ft) from the fuel dispensing devices that they serve. Emergency shutoff devices or electrical disconnects shall disconnect power to all dispensing devices; to all remote pumps serving the dispensing devices; to all associated power, control, and signal circuits; and to all other electrical equipment in the hazardous (classified) locations surrounding the fuel dispensing devices. When more than one emergency shutoff device or electrical disconnect is provided, all devices shall be interconnected. Resetting from an emergency shutoff condition shall require manual intervention and the manner of resetting shall be approved by the authority having jurisdiction.

Exception: Intrinsically safe electrical equipment need not meet this requirement.

6.7.1 At attended motor fuel dispensing facilities, the devices or disconnects shall be readily accessible to the attendant.

6.7.2 At unattended motor fuel dispensing facilities, the devices or disconnects shall be readily accessible to patrons and at least one additional device or disconnect shall be readily accessible to each group of dispensing devices on an individual island.

6.8 Vapor Recovery Systems.

6.8.1 Dispensing devices that incorporate vapor recovery shall be listed.

6.8.2 Hose nozzle valves used on vapor recovery systems shall be listed for the purpose.

6.8.3 Means shall be provided in the vapor return path from each dispensing outlet to prevent the discharge of vapors when the hose nozzle valve is in its normal nondispensing position.

Chapter 7 Building Construction Requirements

7.1 Scope.

This chapter shall apply to the construction of buildings and portions of buildings that are motor fuel dispensing facilities or repair garages.

7.2 General Requirements.

(Reserved)

7.3 Motor Fuel Dispensing Facilities.

7.3.1 Occupancy Classification. The occupancy classification of a motor fuel dispensing facility that is located inside a building or structure shall be a low hazard industrial occupancy as defined in NFPA *101*, *Life Safety Code*.

7.3.2 General Construction Requirements. **(Reserved)**

7.3.3 Means of Egress. In a motor fuel dispensing facility that is located inside a building or structure, the required number, location, and construction of means of egress shall meet all applicable requirements for special purpose industrial occupancies, as set forth in NFPA *101*, *Life Safety Code*.

7.3.4 Drainage. Where Class I or Class II liquids are dispensed, provisions shall be made to prevent spilled liquids from flowing into the interior of buildings. Such provisions shall be made by grading driveways, raising door sills, or other equally effective means.

7.3.5 Fixed Fire Protection.

7.3.5.1* For an unattended, self-serve, motor fuel dispensing facility, additional fire protection shall be provided where required by the authority having jurisdiction.

7.3.5.2 Where required, an automatic fire suppression system shall be installed in accordance with the appropriate NFPA standard, manufacturers' instructions, and the listing requirements of the systems.

7.3.6 Fuel Dispensing Areas Inside Buildings.

7.3.6.1 The fuel dispensing area shall be separated from all other portions of the building by walls, partitions, floors, and floor–ceiling assemblies having a fire resistance rating of not less than 2 hours.

7.3.6.2 Interior finish shall be of noncombustible materials or of approved limited-combustible materials, as defined in NFPA 220, *Standard on Types of Building Construction*.

7.3.6.3 Door and window openings in fire-rated interior walls shall be provided with listed fire doors having a fire protection rating of not less than 1½ hours. Doors shall be self-closing. They shall be permitted to remain open during normal operations if they are designed to close automatically in a fire emergency by means of listed closure devices. Fire doors shall be installed in accordance with NFPA 80, *Standard for Fire Doors and Other Opening Protectives*. They shall be kept unobstructed at all times.

7.3.6.4 Openings for ducts in fire-rated interior partitions and walls shall be protected by listed fire dampers. Openings for ducts in fire-rated floor or floor–ceiling assemblies shall be protected with enclosed shafts. Enclosure of shafts shall be with wall or partition assemblies having a fire resistance rating of not less than 2 hours. Openings for ducts into enclosed shafts shall be protected with listed fire dampers.

7.3.6.5 The fuel dispensing area shall be located at street level, with no dispenser located more than 15 m (50 ft) from the vehicle exit to, or entrance from, the outside of the building.

7.3.6.6 The fuel dispensing area shall be limited to that required to serve not more than four vehicles at one time.

Exception: At a fleet vehicle motor fuel dispensing facility inside a building, where only Class II and Class III liquids are dispensed, the number of vehicles serviced at any one time shall be permitted to be increased to 12.

7.3.6.7* A mechanical exhaust system that serves only the fuel dispensing area shall be provided. This system shall meet all of the following requirements:

(1) The system shall be interlocked with the dispensing system so that airflow is established before any dispensing device can operate. Failure of airflow shall automatically shut down the dispensing system.

(2) The exhaust system shall be designed to provide air movement across all portions of the floor of the fuel dispensing area and to prevent the flowing of ignitible vapors beyond the dispensing area.

(3) Exhaust inlet ducts shall not be less than 76 mm (3 in.) or more than 305 mm (12 in.) above the floor. Exhaust ducts shall not be located in floors or penetrate the floor of the dispensing area. Exhaust ducts shall discharge

to a safe location outside the building.

(4) The exhaust system shall provide ventilation at a rate of not less than 0.3 $m^3/min/m^2$ (1 $ft^3/min/ft^2$) of floor area, based on the fuel dispensing area.

(5) The exhaust system shall meet all applicable requirements of NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*.

Exception: The provisions of 7.3.6.7 shall not apply to a fuel dispensing area located inside a building if two or more sides of the dispensing area are open to the building exterior.

7.3.6.8 The floor of the dispensing area shall be liquidtight. Where Class I liquids are dispensed, provisions shall be made to prevent spilled liquids from flowing out of the fuel dispensing area and into other areas of the building by means of curbs, scuppers, special drainage systems, or other means acceptable to the authority having jurisdiction.

7.3.6.9* Oil drainage systems shall be equipped with approved oil/water traps or separators if they connect to public sewers or discharge into public waterways.

7.4 Repair Garages.

7.4.1 Occupancy Classification. The occupancy classification of a repair garage shall be a special purpose industrial occupancy as defined in NFPA *101*, *Life Safety Code*.

7.4.2 General Construction Requirements. In major repair garages, where CNG-fueled vehicles, hydrogen-fueled vehicles, LNG-fueled vehicles, or LP-Gas-fueled vehicles are repaired, all applicable requirements of NFPA 52, *Vehicular Fuel Systems Code*, or NFPA 58, *Liquefied Petroleum Gas Code*, whichever is applicable, shall be met.

7.4.3 Means of Egress. In a repair garage, the required number, location, and construction of means of egress shall meet all applicable requirements for special purpose industrial occupancies, as set forth in NFPA *101*, *Life Safety Code*.

7.4.4 Drainage. In areas of repair garages used for repair or servicing of vehicles, floor assemblies shall be constructed of noncombustible materials or, if combustible materials are used in the assembly, they shall be surfaced with approved, nonabsorbent, noncombustible material.

Exception: Slip-resistant, nonabsorbent, interior floor finishes having a critical radiant flux not more than 0.45 W/cm^2 (9.87 Btu/in^2), as determined by NFPA 253, Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source, shall be permitted.

7.4.4.1 Floors shall be liquidtight to prevent the leakage or seepage of liquids and shall be sloped to facilitate the movement of water, fuel, or other liquids to floor drains.

7.4.4.2 In areas of repair garages where vehicles are serviced, any floor drains shall be properly trapped and shall discharge through an oil/water separator to the sewer or to an outside vented sump.

7.4.5 Pits, Belowgrade Work Areas, and Subfloor Work Areas.

7.4.5.1 Pits, belowgrade work areas, and subfloor work areas used for lubrication, inspection, and minor automotive maintenance work shall comply with the provisions of this chapter, in addition to other applicable requirements of this code.

7.4.5.2 Walls, floors, and structural supports shall be constructed of masonry, concrete, steel, or other approved noncombustible materials.

7.4.5.3 In pits, belowgrade work areas, and subfloor work areas, the required number, location, and construction of means of egress shall meet the requirements for special purpose industrial occupancies in Chapter 40 of NFPA *101*, *Life Safety Code*.

7.4.5.4 Pits, belowgrade work areas, and subfloor work areas shall be provided with exhaust ventilation at a rate of not less than 0.3 $m^3/min/m^2$ (1 $ft^3/min/ft^2$) of floor area at all times that the building is occupied or when vehicles are parked in or over these areas. Exhaust air shall be taken from a point within 0.3 m (12 in.) of the floor.

7.4.6 Fixed Fire Protection. Automatic sprinkler protection installed in accordance with the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems*, shall be provided in major repair garages, as herein defined, when any of the following conditions exist:

(1) The major repair garage is two or more stories in height, including basements, and any one of the floors exceeds 930 m^2 (10,000 ft^2).

(2) The major repair garage is one story and exceeds 1115 m^2 (12,000 ft^2).

(3) The major repair garage is servicing vehicles parked in the basement of the building.

7.4.7 Gas Detection System. Repair garages used for repair of vehicle engine fuel systems fueled by non-odorized gases, such as hydrogen and non-odorized LNG/CNG, shall be provided with an approved flammable gas detection system.

7.4.7.1 System Design. The flammable gas detection system shall be calibrated to the types of fuels or gases used by vehicles to be repaired. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL). Gas detection shall also be provided in lubrication or chassis repair pits of repair garages used for repairing non-odorized LNG/CNG-fueled vehicles.

7.4.7.2 Operation. Activation of the gas detection system shall result in all of the following:

(1) Initiation of distinct audible and visual alarm signals in the repair garage

(2) Deactivation of all heating systems located in the repair garage

(3) Activation of the mechanical ventilation system, when the system is interlocked with gas detection

7.4.7.3 Failure of the Gas Detection System. Failure of the gas detection system shall result in the deactivation of the heating system and activation of the mechanical ventilation system and, where the ventilation system is interlocked with gas detection, shall cause a trouble signal to sound in an approved location.

7.5* Heating, Ventilating, and Air-Conditioning.

7.5.1* Forced air heating, air-conditioning, and ventilating systems serving a fuel dispensing area inside a building or a repair garage shall not be interconnected with any such systems serving other occupancies in the building. Such systems shall be installed in accordance with NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

7.5.2 Return air openings in areas of repair garages used for the repair or servicing of vehicles or in a fuel dispensing area shall be not less than 455 mm (18 in.) above floor level measured to the bottom of the openings.

7.5.3 Combined ventilation and heating systems shall not recirculate air from areas that are below grade level.

7.5.4 Exhaust duct openings shall be located so that they effectively remove vapor accumulations at floor level from all parts of the floor area.

7.6 Heat-Producing Appliances.

7.6.1 Heat-producing appliances shall be installed in accordance with the requirements of Section 7.6. They shall be permitted to be installed in the conventional manner except as provided in Section 7.6.

7.6.2 Heat-producing appliances shall be of an approved type. Solid fuel stoves, improvised furnaces, salamanders, or space heaters shall not be permitted in areas of repair garages used for repairing or servicing of vehicles or in a fuel dispensing area.

Exception No. 1: Unit heaters, when installed in accordance with this chapter, need not meet this requirement.

Exception No. 2: Heat-producing equipment for any lubrication room or service room where there is no dispensing or transferring of Class I or Class II liquids or LP-Gas, when installed in accordance with this chapter, need not meet this requirement.

7.6.3 Heat-producing appliances shall be permitted to be installed in a special room that is separated from areas that are classified as Division 1 or Division 2, in accordance with Chapter 8, by walls that are constructed to prevent the transmission of vapors, that have a fire resistance rating of at least 1 hour, and that have no openings in the walls that lead to a classified area within 2.4 m (8 ft) of the floor. Specific small openings through the wall, such as for piping and electrical conduit, shall be permitted, provided the gaps and voids are filled with a fire-resistant material to resist transmission of vapors. All air for combustion purposes shall be taken from outside the building. This room shall not be used for storage of combustible materials, except for fuel storage as permitted by the standards referenced in 7.6.9.

7.6.4 Heat-producing appliances using gas or oil fuel shall be permitted to be installed in a lubrication or service room where there is no dispensing or transferring of Class I liquids, including the open draining of automotive gasoline tanks, provided the bottom of the combustion chamber is at least 455 mm (18 in.) above the floor and the appliances are protected from physical damage.

7.6.5 Heat-producing appliances using gas or oil fuel listed for use in garages shall be permitted to be installed in lubrication rooms, service rooms, or fuel dispensing areas where Class I liquids are dispensed or transferred, provided the equipment is installed at least 2.4 m (8 ft) above the floor.

7.6.6* Where major repairs are conducted on CNG-fueled vehicles or LNG-fueled vehicles, open flame heaters or heating equipment with exposed surfaces having a temperature in excess of 399°C (750°F) shall not be permitted in areas subject to ignitible concentrations of gas.

7.6.7 Electrical heat-producing appliances shall meet the requirements of Chapter 8.

7.6.8 Fuels used shall be of the type and quality specified by the manufacturer of the heating appliance. Crankcase drainings shall not be used in oil-fired appliances, unless the appliances are specifically approved for such use.

7.6.9 Heat-producing appliances shall be installed to meet the requirements of NFPA 31, *Standard for the Installation of Oil-Burning Equipment*; NFPA 54, *National Fuel Gas Code*; NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment*; NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*; and NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances*, as applicable, except as hereinafter specifically provided.

7.7* Dynamic Automotive Emissions Testing Equipment.

Equipment for the testing of vehicle emissions shall be approved or listed for its intended use and shall comply with the electrical classification for the area in which the equipment is installed.

Chapter 8 Electrical Installations

8.1 Scope.

This chapter shall apply to the installation of electrical wiring and electrical utilization equipment in areas where liquids are stored, handled, or dispensed.

8.2 General Requirements.

Electrical wiring and electrical utilization equipment shall be of a type specified by and shall be installed in accordance with NFPA 70, *National Electrical Code*. Electrical wiring and electrical utilization equipment shall be approved for the locations in which they are installed.

8.2.1* In major repair garages where CNG vehicles are repaired or stored, the area within 455 mm (18 in.) of the ceiling shall be designated a Class I, Division 2 hazardous (classified) location.

Exception: In major repair garages, where ventilation equal to not less than four air changes per hour is provided, this requirement shall not apply.

8.3 Installation in Classified Locations.

8.3.1* Table 8.3.1 shall be used to delineate and classify areas for the purposes of installing electrical wiring and electrical utilization equipment. *(See also Figure 8.3.1.)*

Table 8.3.1 Electrical Equipment Classified Areas — Motor Fuel Dispensing Facilities

Location	*NEC* Class I, Group D Division	Extent of Classified Area[a]
Dispensing device[b,c]	(Except overhead type)	*(see Figure 8.3.1)*
Pits	1	Any pit or box below grade level, any part of which is within a Division 1 or 2 classified area
Dispenser	2	Within 46 cm (18 in.) horizontally in all directions extending to grade from the dispenser enclosure or that portion of the dispenser enclosure containing liquid handling components[c]

Table 8.3.1 Electrical Equipment Classified Areas — Motor Fuel Dispensing Facilities

Location	*NEC* Class I, Group D Division	Extent of Classified Area[a]
Outdoor	2	Up to 46 cm (18 in.) above grade level within 6 m (20 ft) horizontally of any edge of enclosure
Indoor		
With mechanical ventilation	2	Up to 46 cm (18 in.) above grade or floor level within 6 m (20 ft) horizontally of any edge of enclosure
With gravity ventilation	2	Up to 46 cm (18 in.) above grade or floor level within 7.6 m (25 ft) horizontally of any edge of enclosure
Dispensing device— overhead[c,d]		The area within the dispenser enclosure and all electrical equipment integral with the dispensing hose or nozzle
	2	An area extending 46 cm (18 in.) horizontally in all directions beyond the enclosure and extending to grade
	2	Up to 46 cm (18 in.) above grade level within 6 m (20 ft) horizontally measured from a point vertically below the edge of any dispenser enclosure
Remote pump — outdoor	1	Any pit or box below grade level if any part is within a horizontal distance of 3 m (10 ft) from any edge of pump
	2	Within 0.91 m (3 ft) of any edge of pump, extending in all directions; also up to 46 cm (18 in.) above grade level within 3 m (10 ft) horizontally from any edge of pump
Remote pump — indoor	1	Entire area within any pit
	2	Within 1.5 m (5 ft) of any edge of pump, extending in all directions; also up to 0.91 m (3 ft) above floor or grade level within 7.6 m (25 ft) horizontally from any edge of pump

Table 8.3.1 Electrical Equipment Classified Areas — Motor Fuel Dispensing Facilities		
Location	***NEC* Class I, Group D Division**	**Extent of Classified Area[a]**
Lubrication or service room where Class I liquids or gaseous fuels (such as natural gas, hydrogen, or LPG) are transferred *(see 8.3.5)*	1	Any pit within any unventilated area
	2	Any pit with ventilation in which six air changes per hour are exhausted from a point within 300 mm (12 in.) of the floor level of the pit
	2	Area up to 46 cm (18 in.) above floor or grade level and 0.91 m (3 ft) horizontally from a lubrication pit
	2	Area up to a level of 46 cm (18 in.) above the floor or grade level of the lubrication or service room
	Nonclassified	Area up to a level of 46 cm (18 in.) above the floor or grade level of the lubrication or service room where ventilation of at least 1 $ft^3/min/ft^2$ of ceiling area taken from a point within 46 cm (18 in.) of the highest point in the ceiling is provided
Dispenser for Class I liquids[c]	2	Within 0.91 m (3 ft) of any fill or dispensing point, extending in all directions
Lubrication or service room where Class I liquids or gaseous fuels (such as natural gas, hydrogen, or LPG) are not transferred *(see 8.3.5)*	2	Entire area within any pit used for lubrication or similar services where Class I liquids can be released
	2	Area up to 46 cm (18 in.) above any such pit and extending a distance of 0.91 m (3 ft) horizontally from any edge of the pit
	2	Entire unventilated area within any pit, belowgrade area, or subfloor area
	2	Area up to 46 cm (18 in.) above any such unventilated pit, belowgrade work area, or subfloor work area and extending a distance of 0.91 m (3 ft) horizontally from the edge of any such pit, belowgrade work area, or subfloor work area
	Nonclassified	Any pit, belowgrade work area, or subfloor work area that is ventilated in accordance with 7.4.5.4
In major repair garages where lighter-than-air gaseous fuel (such as natural gas or hydrogen) vehicles are repaired or stored	2	Area within 46 cm (18 in.) of the ceiling
	Nonclassified	Area within 46 cm (18 in.) of the ceiling where ventilation of at least 1 $ft^3/min/ft^2$ of ceiling area taken from a point within 46 cm (18 in.) of the highest point in the ceiling is provided
Interior of special enclosure or vault	1	Entire interior volume, if Class I liquids are stored within

Table 8.3.1 Electrical Equipment Classified Areas — Motor Fuel Dispensing Facilities

Location	*NEC* Class I, Group D Division	Extent of Classified Area[a]
Sales, storage, and rest rooms	Nonclassified	If there is any opening to these rooms within the extent of a Division 1 area, the entire room is classified as Division 1
Tank, aboveground	1	Area inside dike where dike height is greater than the distance from the tank to the dike for more than 50 percent of the tank circumference
Shell, ends, or roof and dike area	2	Within 3 m (10 ft) of shell, ends, or roof of tank; area within dike to level of top of dike
Specific areas adjacent to classified locations	Nonclassified	Areas adjacent to classified locations in which flammable vapors are not likely to be released, such as stock rooms, switchboard rooms, and other similar locations, shall not be classified where mechanically ventilated at a rate of four or more air changes per hour, or designed with positive air pressure, or where effectively cut off by walls or partitions.
Vent	1	Within 1.5 m (5 ft) of open end of vent, extending in all directions
	2	Between 1.5 m (5 ft) and 3 m (10 ft) from open end of vent, extending in all directions
Underground tank fill opening	1	Any pit or box below grade level, any part of which is within a Division 1 or 2 classified area
	2	Up to 46 cm (18 in.) above grade level within a horizontal radius of 3 m (10 ft) from a loose fill connection and within a horizontal radius of 1.5 m (5 ft) from a tight fill connection
Vapor processing systems pits	1	Any pit or box below grade level, any part of which is within a Division 1 or 2 classified area or that houses any equipment used to transport or process vapors
Vapor processing equipment located within protective enclosures *(see 10.1.7)*	2	Within any protective enclosure housing vapor processing equipment
Vapor processing equipment not within protective enclosures (excluding piping and combustion devices)	2	The space within 46 cm (18 in.) in all directions of equipment containing flammable vapors or liquid extending to grade level; up to 46 cm (18 in.) above grade level within 3 m (10 ft) horizontally of the vapor processing equipment
Equipment enclosures	1	Any area within the enclosure where vapor or liquid is present under normal operating conditions
	2	Entire area within the enclosure other than Division 1

Table 8.3.1 Electrical Equipment Classified Areas — Motor Fuel Dispensing Facilities

Location	*NEC* Class I, Group D Division	Extent of Classified Area[a]
Vacuum-assist blowers	2	The space within 46 cm (18 in.) in all directions extending to grade level; up to 46 cm (18 in.) above grade level within 3 m (10 ft) horizontally
Vault	1	Entire interior volume if Class I liquids are stored within
Vent discharging upward	1	Within 0.91 m (3 ft) of open end of vent, extending in all directions
	2	Area between 0.91 m (3 ft) and 1.5 m (5 ft) of open end of vent, extending in all directions

[a]For marine application, *grade level* means the surface of a pier, extending down to water level.

[b]Refer to Figure 8.3.1 for an illustration of classified areas around dispensing devices.

[c]Area classification inside the dispenser enclosure is covered in UL 87, *Standard for Power-Operated Dispensing Devices for Petroleum Products.*

[d]Ceiling-mounted hose reel.

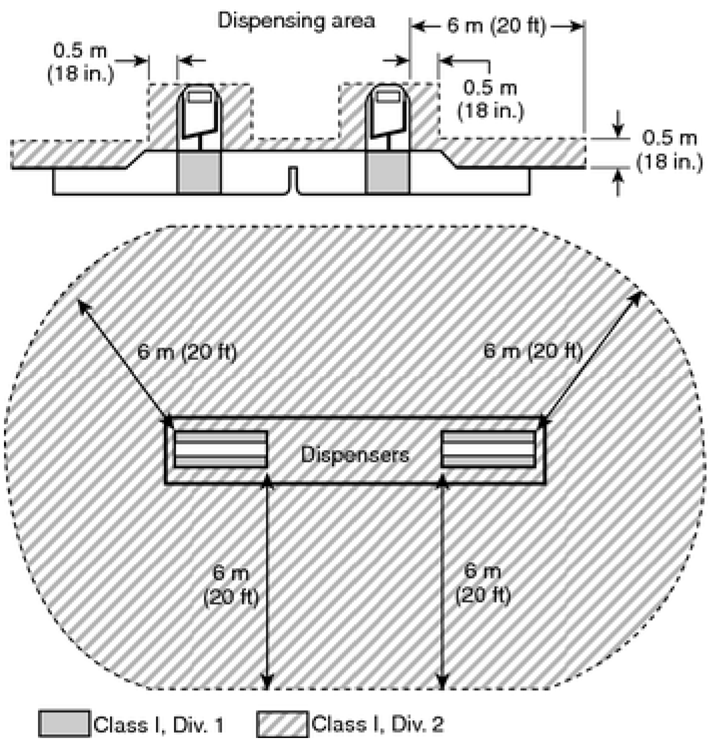

FIGURE 8.3.1 Classified Areas Adjacent to Dispensers as Detailed in Table 8.3.1.

Exception: The extent of the classified area around a vacuum-assist blower shall be permitted to be reduced if the blower is specifically listed for such reduced distances.

8.3.2 A designated classified area, as specified in Table 8.3.1, shall not extend beyond a floor, wall, roof, or other solid partition that has no openings.

8.3.3 The area classifications given in Table 8.3.1 shall be based on the premise that the installation meets the applicable requirements of this code in all respects. Should this not be the case, the authority having jurisdiction shall be permitted to determine the extent of the classified area.

8.3.4 All electrical wiring and electrical utilization equipment that is integral with the dispensing hose or dispensing nozzle shall be approved for use in Class I, Division 1 classified locations.

8.3.5 Where Class I liquids are stored, handled, or dispensed, electrical wiring and electrical utilization equipment shall be designed and installed in accordance with the requirements for Class I, Division 1 or Division 2 classified locations, as set forth in Table 8.3.1 and in NFPA 70, *National Electrical Code*.

Exception: The storage, handling, and dispensing of methyl alcohol–based windshield washer fluids shall not cause an area to be designated as a hazardous (classified) location.

8.3.6 The storage, handling, and dispensing of Class II or Class III liquids shall not cause an area to be designated as a hazardous (classified) location.

8.4 Emergency Electrical Disconnects.

Emergency electrical disconnects shall be installed at the locations required by Section 6.7.

8.5 Specific Requirements for Marine Fuel Facilities.

8.5.1 Where excessive stray currents are encountered, piping handling Class I and Class II liquids shall be electrically isolated from the shore piping.

8.5.2* Pipelines on piers shall be bonded and grounded. Bonding and grounding connections on all pipelines shall be located on the pier side of hose riser insulating flanges, if used, and shall be accessible for inspection.

8.5.3 The fuel delivery nozzle shall be put into contact with the vessel fill pipe before the flow of fuel commences, and this bonding contact shall be continuously maintained until fuel flow has stopped to avoid possibility of electrostatic discharge.

Chapter 9 Operational Requirements

9.1 Scope.

This chapter shall apply to those requirements that relate to the operation of motor fuel dispensing facilities and fuel dispensing systems.

9.2 Basic Requirements.

9.2.1* Inventory Control. Accurate daily inventory records shall be maintained and reconciled for all liquid fuel storage tanks for indication of possible leakage from tanks or piping. The records shall be kept on the premises or shall be made available to the authority having jurisdiction for inspection within 24 hours of a written or verbal request. The records shall include, as a minimum and by product, daily reconciliation between sales, use, receipts, and inventory on hand. If there is more than one storage system serving an individual pump or dispensing device for any product, the reconciliation shall be maintained separately for each system.

9.2.2 Tank Filling and Bulk Delivery.

9.2.2.1 Delivery operations shall meet all applicable requirements of NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids* and the requirements of 9.2.2.2 through 9.2.2.4.

9.2.2.2 The delivery vehicle shall be separated from any aboveground tank by at least 7.6 m (25 ft).

Exception No. 1: No minimum separation distance shall be required for tanks that are filled by gravity.

Exception No. 2: The required minimum separation distance shall be permitted to be reduced to 4.6 m (15 ft) where the fuel being delivered is not a Class I liquid.

9.2.2.3 The delivery vehicle shall be located so that all parts of the vehicle are on the premises when delivery is made.

Exception: This requirement shall not apply to existing fuel dispensing facilities and fuel dispensing facilities inside buildings.

9.2.2.4 Tank filling shall not begin until the delivery operator has determined that the tank has sufficient available capacity (ullage).

9.2.2.5 Tanks shall be filled through a liquidtight connection.

9.2.2.5.1 Where an aboveground tank is filled by means of fixed piping, either a check valve and shutoff valve with a quick-connect coupling or a check valve with a dry-break coupling shall be installed in the piping at a point where connection and disconnection is made between the tank and the delivery vehicle. This device shall be protected from tampering and physical damage.

9.2.2.5.2 Underground tanks and tanks in belowgrade vaults shall be filled through a liquidtight connection within a spill container as specified in 4.3.3.3 through 4.3.3.7.

9.2.3 Dispensing into Containers.

9.2.3.1* Class I or Class II liquids shall not be dispensed into portable containers unless the container is constructed of metal or is approved by the authority having jurisdiction, has a tight closure, and is fitted with a spout or so designed that the contents can be poured without spilling. The hose nozzle valve shall be manually held open during the dispensing operation.

9.2.3.2 No sale or purchase of any Class I, Class II, or Class III liquids shall be made in containers unless such containers are clearly marked with the name of the product contained therein.

9.2.3.3 Portable containers of 45 L (12 gal) capacity or less shall not be filled while they are in or on a motor vehicle or marine craft.

9.2.4 Dispensing from a Tank That Does Not Exceed 454 L (120 Gal) and from Containers Inside Buildings. Dispensing of flammable and combustible liquids from a tank not exceeding 454 L (120 gal) capacity and from containers in a motor fuel dispensing facility or in a repair garage building shall meet the requirements of 9.2.4.1 and 9.2.4.2. *(See 4.3.9 for storage quantity limitations.)*

9.2.4.1 Not more than one container of Class I liquid shall be permitted to be provided with a dispensing pump inside a building at any one time. The number of tanks or containers of Class II or Class IIIA liquids fitted for dispensing at any one time shall not be limited, except as provided for in 4.3.9.2. The number of tanks or containers of Class IIIB liquids fitted for dispensing at any one time shall not be limited.

9.2.4.2 Class I, Class II, and Class IIIA liquids shall not be dispensed by applying pressure to tanks or containers. Listed pumps that take suction through the top of the tank or container or listed self-closing faucets shall be used.

9.2.5 Basic Fire Control.

9.2.5.1 Sources of Ignition. Smoking materials, including matches and lighters, shall not be used within 6 m (20 ft) of areas used for fueling, servicing fuel systems of internal combustion engines, or receiving or dispensing of Class I and Class II liquids. The motors of all equipment being fueled shall be shut off during the fueling operation except for emergency generators, pumps, and so forth, where continuing operation is essential.

9.2.5.2 Fire Extinguishers. Each motor fuel dispensing facility or repair garage shall be provided with fire extinguishers installed, inspected, and maintained as required by NFPA 10, *Standard for Portable Fire Extinguishers*. Extinguishers for outside motor fuel dispensing areas shall be provided according to the extra (high) hazard requirements for Class B hazards, except that the maximum travel distance to an 80 B:C extinguisher shall be permitted to be 30.48 m (100 feet).

9.2.5.3 Fire Suppression Systems. Where required, automatic fire suppression systems shall be installed in accordance with the appropriate NFPA standard, manufacturers' instructions, and the listing requirements of the systems.

9.2.5.4* Signs. Warning signs shall be conspicuously posted in the dispensing area and shall incorporate the following or equivalent wording:

WARNING
It is unlawful and dangerous to dispense gasoline into unapproved containers.
No smoking.
Stop motor.
No filling of portable containers in or on a motor vehicle.
Place container on ground before filling.
Discharge your static electricity before fueling by touching a metal surface away from the nozzle.
Do not re-enter your vehicle while gasoline is pumping.
If a fire starts, **do not** remove nozzle — back away immediately.
Do not allow individuals under licensed age to use the pump.

9.2.6 Waste Handling.

9.2.6.1 Crankcase drainings and waste liquids shall not be dumped into sewers, into streams, or on the ground. They shall be stored in approved tanks or containers outside any building, or in tanks installed in accordance with Chapters 4 and 5, until removed from the premises.

Exception: As provided for in 4.3.9.3.

9.2.6.2 The contents of oil separators and traps of floor drainage systems shall be collected at sufficiently frequent intervals to prevent oil from being carried into sewers.

9.2.7 Housekeeping. The dispensing area and the area within any dike shall be kept free of vegetation, debris, and any other material that is not necessary to the proper operation of the motor fuel dispensing facility.

9.2.8 Fire Doors. Fire doors shall be kept unobstructed at all times. Appropriate signs and markings shall be used.

9.3 Operating Requirements for Full-Service Motor Fuel Dispensing Facilities.

Each motor fuel dispensing facility shall have an attendant or supervisor on duty whenever the facility is open for business. The attendant or supervisor shall dispense liquids into fuel tanks or into containers, except as covered in Sections 9.4 and 9.5.

9.4 Operating Requirements for Attended Self-Service Motor Fuel Dispensing Facilities.

9.4.1 Self-service motor fuel dispensing facility shall mean that portion of a property where liquids used as motor fuels are stored and dispensed from fixed, approved dispensing equipment into the fuel tanks of motor vehicles by persons other than the facility attendant and shall also include, where provided, facilities for the sale of other retail products.

9.4.2 There shall be at least one attendant on duty while the self-service facility is open for business. The attendant's primary function shall be to supervise, observe, and control the dispensing of Class I liquids while said liquids are being dispensed.

9.4.3 The responsibility of the attendant shall be as follows:

(1) Prevent the dispensing of Class I liquids into portable containers not in compliance with 9.2.3.1

(2) Prevent the use of hose nozzle valve latch-open devices that do not comply with 6.5.2

(3) Control sources of ignition

(4) Immediately activate emergency controls and notify the fire department of any fire or other emergency

(5) Handle accidental spills and fire extinguishers if needed

9.4.3.1 The attendant or supervisor on duty shall be mentally and physically capable of performing the functions and assuming the responsibility prescribed in Section 9.4.

9.4.4 Operating instructions shall be conspicuously posted in the dispensing area.

9.5 Operating Requirements for Unattended Self-Service Motor Fuel Dispensing Facilities.

9.5.1 Unattended self-service facilities shall be permitted, where approved by the authority having jurisdiction.

9.5.2 Operating instructions shall be conspicuously posted in the dispensing area. The instructions shall include location of emergency controls and a requirement that the user stay outside of his/her vehicle and in view of the fueling nozzle during dispensing.

9.5.3 In addition to the warning signs specified in 9.2.5.4, emergency instructions shall be conspicuously posted in the dispenser area. The instructions shall incorporate the following or equivalent wording:

Emergency Instructions

In case of fire or spill

(1) Use emergency stop button.

(2) Report accident by calling (*specify local fire number*). Report location.

9.5.4 A listed, automatic-closing-type hose nozzle valve with latch-open device shall be provided. The hose nozzle valve shall meet the requirements of 6.6.2.

9.5.5 A telephone or other approved, clearly identified means to notify the fire department shall be provided on the site in a location approved by the authority having jurisdiction.

9.5.6* Additional fire protection shall be provided where required by the authority having jurisdiction.

9.6 Refueling from Tank Vehicles.

The dispensing of Class I and Class II liquids in the open from a tank vehicle to a motor vehicle located at commercial, industrial, governmental, or manufacturing establishments and intended for fueling vehicles used in connection with their businesses shall be permitted only if all of the requirements of 9.6.1 through 9.6.7 have been met.

9.6.1 An inspection of the premises and operations shall be made and operations shall not be conducted unless approved by the authority having jurisdiction.

9.6.2 The tank vehicle shall comply with the requirements of NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids*.

9.6.3 The dispensing hose shall not exceed 15 m (50 ft) in length.

9.6.4 The dispensing nozzle shall be a listed, automatic-closing type without a latch-open device.

9.6.5 Nighttime deliveries shall only be made in areas deemed adequately lighted by the authority having jurisdiction.

9.6.6 The tank vehicle flasher lights shall be in operation while dispensing operations are in progress.

9.6.7 Expansion space shall be left in each fuel tank to prevent overflow in the event of temperature increase.

9.7 Repair Areas.

9.7.1 General. Repairing of motor vehicles shall be restricted to areas specifically provided for such purposes.

9.7.2 Welding and Open Flame Operations.

9.7.2.1 Operations involving open flame or electric arcs, including fusion gas and electric welding, shall be restricted to areas specifically provided for such purposes. Cutting and welding and related fire prevention precautions shall be in accordance with the requirements of NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*.

9.7.2.2 Electric arc welding generators or transformers shall conform to NFPA 70, *National Electrical Code*. Gas fusion welding apparatus and storage of compressed gas cylinders shall be in accordance with the provisions of NFPA 51, *Standard for the Design and Installation of Oxygen–Fuel Gas Systems for Welding, Cutting, and Allied Processes*.

9.7.2.3* The grounded side of an electric welding circuit shall be attached to the part being welded.

9.7.2.4 Compressed gases shall be stored in accordance with Chapter 4 of NFPA 51, *Standard for the Design and Installation of Oxygen–Fuel Gas Systems for Welding, Cutting, and Allied Processes*.

9.7.2.5 Gas fusion welding equipment shall be periodically inspected for worn or injured hoses and defective or damaged valves, gauges, and reducing devices.

9.7.2.6 Cylinders stored outside in the open shall have valves and safety devices protected against the accumulation of ice and snow.

9.7.3 Spray Painting and Undercoating.

9.7.3.1 Spray painting shall meet the requirements of NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*.

9.7.3.2 Where only a small portion of a vehicle is spray painted and no accumulations of paint residue are allowed to form, such occasional painting shall be permitted in the open in the structure if located not less than 6 m (20 ft) horizontally from all open flame devices or spark-producing electrical equipment or appliances.

9.7.3.3 Undercoating spray operations conducted in any area having adequate natural or mechanical ventilation shall be exempt from the requirements pertaining to spray finishing operations where the undercoating materials are nonflammable or where the solvents used have a flash point in excess of 37.8°C (100°F) (closed cup). There shall be no open flame devices or spark-producing electrical equipment or appliances within 6 m (20 ft) horizontally while such operations are conducted. Undercoating materials shall be dry before starting the engine of the undercoated vehicle.

9.7.3.4 Undercoating spray operations that do not meet the requirements of 9.7.3.3 shall meet all requirements of NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*.

9.7.4 Drying Apparatus. Drying and baking apparatus in connection with the spray application of flammable finishes shall conform to NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*, and NFPA 86, *Standard for Ovens and Furnaces*.

9.7.5 Repair of Fuel Tanks.

9.7.5.1 Prior to repair work on fuel tanks of vehicles involving flame- or heat-producing devices, the tanks shall be drained and purged, or inerted, and tested in accordance with applicable procedures outlined in NFPA 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair*.

9.7.5.2 In lieu of draining the fuel tank outside the building, an approved portable pump and storage tank shall be permitted to be used.

9.7.5.3 Fuel drained from vehicle tanks that is not to be disposed of shall be stored in approved safety cans or returned to standard underground storage tanks.

9.7.5.4 Fuel to be disposed of shall be stored in tanks or drums suitable for such purpose that shall be located outside of the building until removed from the premises. Such containers shall be identified as having flammable contents.

9.7.6 Parts Cleaning.

9.7.6.1 Cleaning of parts shall be performed with a nonflammable solvent.

Exception: A combustible liquid with a flash point above 37.8°C (100°F) (closed cup) shall be permitted to be used for this purpose provided adequate ventilation is supplied and no sources of ignition are present in the cleaning area.

9.7.6.2 Devices used to heat nonflammable solvent shall conform to the requirements of one or both of the following:

(1) NFPA 31, *Standard for the Installation of Oil-Burning Equipment*

(2) NFPA 54, *National Fuel Gas Code*

9.7.6.2.1 The heating devices described in 9.7.6.2 shall be installed in accordance with the requirements of Section 7.6.

9.7.6.3 A device for heating solvents that give off flammable or toxic vapors when heated shall be provided with a limit control to prevent the solvent from exceeding a temperature 10°C (50°F) below the point at which flammable or toxic vapors are released.

9.7.6.4 Direct-fired parts cleaners shall not be installed or used below grade.

9.7.7 Chassis Cleaning.

9.7.7.1 Chassis cleaning shall not be performed with liquids having flash points below 60°C (140°F) (closed cup). If steam is used, it shall be supplied from a boiler located, installed, and safeguarded in accordance with the applicable requirements for heating equipment in Section 7.6 and in the following documents:

(1) NFPA 31, *Standard for the Installation of Oil-Burning Equipment*

(2) NFPA 54, *National Fuel Gas Code*

(3) NFPA 85, *Boiler and Combustion Systems Hazards Code*

9.7.7.2 Steam cleaning devices shall be of an approved type.

9.7.8 Storage and Handling of Flammable and Combustible Liquids, Liquefied Petroleum Gases, and Compressed Natural Gases. Except as otherwise provided by this standard, the storage and handling of flammable and combustible liquids shall be in accordance with NFPA 30, *Flammable and Combustible Liquids Code*. The storage and handling of liquefied petroleum gas shall be in accordance with NFPA 58, *Liquefied Petroleum Gas Code*. The storage and handling of flammable compressed gas fuels shall be in accordance with NFPA 55, *Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary*

Containers, Cylinders, and Tanks, and NFPA 52, *Vehicular Fuel Systems Code*.

9.7.9 Housekeeping.

9.7.9.1 An authorized employee, an officer of the firm, or the owner shall make daily inspections of the repair garage and shall be responsible for the prompt removal or repair of any hazardous condition, including proper maintenance of equipment and safety devices and the immediate removal of accumulations of combustible materials.

9.7.9.2 Clear aisle space shall be maintained to permit ready access to and the use of fire-fighting equipment.

9.7.9.3 Floors shall be kept clean and free of oil and grease. Only approved water solutions or detergents, floor-sweeping compounds, and grease absorbents shall be used for cleaning floors.

9.7.9.4 Metal lockers shall be provided for employees' clothes.

9.7.9.5 Approved metal receptacles with self-closing covers shall be provided for the storage or disposal of oil-soaked waste or cloths.

9.7.9.6 Combustible rubbish shall be placed in covered metal receptacles until removed to a safe place for disposal. Contents of such containers shall be removed daily.

9.7.9.7 Smoking shall be prohibited except in designated areas subject to the approval of the authority having jurisdiction.

Chapter 10 Vapor Processing and Vapor Recovery Systems for Liquid Motor Fuels

10.1 Vapor Processing Systems.

10.1.1 Vapor processing system components, including hose nozzle valves, blowers, vacuum pumps, flame arresters, or systems for preventing flame propagation, controls, and vapor processing equipment shall be individually listed for their intended use.

10.1.2 Dispensing devices used with a vapor processing system shall be listed. Existing listed or labeled dispensing devices shall be permitted to be modified for use with vapor processing systems provided they are "Listed by Report" as specified in 6.3.2.1.

10.1.3 Means shall be provided in the vapor return path from each dispensing outlet to prevent the discharge of vapors when the hose nozzle valve is in its normal nondispensing position.

10.1.4 Vapor processing systems that employ blower-assist shall not be used unless the system is designed to prevent flame propagation through system piping, processing equipment, and tanks.

10.1.5 If a component is likely to contain an ignitable vapor–air mixture under operating conditions and can fail in a manner to ignite the mixture, it shall be designed to withstand an internal explosion without failure to the outside.

10.1.6 Vapor processing equipment shall be located outside of buildings. In addition, it shall be located as follows:

(1) At least 3 m (10 ft) from adjacent property lines that can be built upon

(2) At least 6 m (20 ft) from dispensing devices

Exception: As provided for in 10.1.7.

10.1.7 Where the required distance to adjacent property lines that can be built upon cannot be achieved, means shall be provided to protect the vapor processing equipment against fire exposure. Acceptable means shall include the following:

(1) Protective enclosures constructed of fire-resistant or noncombustible materials that extend at least 455 mm (18 in.) above the equipment

(2) Installation in belowgrade spaces

(3) Protection with an approved water spray system

10.1.7.1 If protective enclosures or belowgrade spaces are used, positive means shall be provided to ventilate the enclosure to prevent pocketing of ignitable vapors. In no case shall vapor processing equipment so protected be located within 1.5 m (5 ft) of adjacent property lines that can be built upon.

10.1.8 Processing equipment shall be protected against physical damage with guardrails, curbs, or fencing.

10.1.9 Electrical equipment shall meet the requirements of Chapter 8.

10.1.10 Vent pipes on vapor processing systems shall discharge only in an upward direction in order to disperse vapors and shall terminate at least 3.6 m (12 ft) above grade. The outlets shall be directed and located so that ignitable vapors will not accumulate or travel to an unsafe location or enter buildings.

10.1.11 Combustion or open flame–type devices shall not be installed in classified areas, as described in Chapter 8.

10.2 Vapor Recovery Systems.

10.2.1 Dispensing devices that incorporate vapor recovery shall be listed.

10.2.2 Hose nozzle valves used on vapor recovery systems shall be listed for the purpose.

10.2.3 Means shall be provided in the vapor return path from each dispensing outlet to prevent the discharge of vapors when the hose nozzle valve is in its normal nondispensing position.

Chapter 11 Marine Fueling

11.1 Scope.

11.1.1 This chapter shall apply to that portion of a property where liquids used as fuels are stored, handled, and dispensed from equipment located on shore or from equipment located on piers, wharves, or floating docks into the fuel tanks of marine craft, including incidental activity, except as covered elsewhere in this code or in other NFPA standards.

11.1.2 This chapter shall not apply to the following:

(1) Bulk plant or terminal loading and unloading facilities

(2) Transfer of liquids utilizing a flange-to-flange closed transfer piping system

(3) Marine motor fuel dispensing facilities where liquids used as fuels are stored and dispensed into the fuel tanks of marine craft of 272 metric tons (300 gross tons) or more

11.1.3 For the purpose of this chapter, the word *pier* shall also mean dock, floating dock, and wharf.

11.2 Storage.

11.2.1 Liquids shall be stored in tanks or containers complying with Section 4.3.

11.2.2* Tanks that supply marine motor fuel dispensing facilities shall be located on shore or on a pier of the solid-fill type. Pumps that are not integral with the dispensing device shall also be located on shore or on a pier of the solid-fill type.

Exception: Tanks shall be permitted with the approval of the authority having jurisdiction to be located on a pier, provided the installation meets all applicable requirements of Chapters 4 and 5 of this document and 21.6.2 of NFPA 30, Flammable and Combustible Liquids Code, and the quantity stored does not exceed 4164 L (1100 gal) aggregate capacity.

11.2.3 Where a tank is at an elevation that produces a gravity head on the dispensing device, the tank outlet shall be equipped with a device, such as a normally closed solenoid valve, that will prevent gravity flow from the tank to the dispenser. This device shall be located adjacent to and downstream of the outlet valve specified by 4.3.2.5.1 of NFPA 30, *Flammable and Combustible Liquids Code*. The device shall be installed and adjusted so that liquid cannot flow by gravity from the tank to the dispenser if the piping or hose fails when the dispenser is not in use.

11.3 Piping Systems.

11.3.1 Piping shall be installed in accordance with all applicable requirements of Chapter 5.

11.3.2 Piping systems shall be supported and protected against physical damage and stresses arising from impact, settlement, vibration, expansion, contraction, and tidal action.

11.3.3 Means shall be provided to ensure flexibility of the piping system in the event of motion of the pier. Flexible piping shall be of a type designed to withstand the forces and pressures exerted upon the piping.

11.3.4 Where dispensing is from a floating structure or pier, approved oil-resistant flexible hose shall be permitted to be used between shore piping and the piping on a floating structure or pier and between separate sections of the floating structure to accommodate changes in water level or shoreline, provided that the hose is either resistant to or shielded from damage by fire.

11.3.5 A valve to shut off the liquid supply from shore shall be provided in each pipeline at or near the approach to the pier and at the shore end of each marine pipeline adjacent to the point where each flexible hose is attached.

11.4 Fuel Dispensing System.

11.4.1 All hose shall be listed. Where hose length exceeds 5.5 m (18 ft), the hose shall be secured so as to protect it from damage.

11.4.2 Dispensing nozzles shall be of the automatic-closing type without a latch-open device.

11.4.3 Dispensing devices shall be permitted to be located on open piers, on shore, or on piers of the solid-fill type and shall be located apart from other structures so as to provide room for safe ingress to and egress from marine craft.

11.4.4 Dispensing devices shall be located so that exposure to all other operational marina or pleasure boat berthing area facilities is minimized. Where tide and weather conditions permit, liquid fuel handling shall be outside the main berthing areas. Where located inside marina or pleasure craft berthing areas, fueling facilities shall be located so that, in case of fire aboard a marine craft alongside, the danger to other craft near the facility is minimized. No vessel or marine craft shall be made fast to or berthed at any fuel dispensing location except during fueling operations.

11.4.5 No vessel or marine craft shall be made fast to any other vessel or marine craft occupying a berth at a fuel dispensing location during fueling operations.

11.4.6 A marine motor fuel dispensing facility located at a bulk plant shall be separated by a fence or other approved barrier from areas in which bulk plant operations are conducted. Dispensing devices shall not be supplied by aboveground tanks located in the bulk plant. Marine motor fuel dispensing facility storage tanks shall not be connected by piping to aboveground tanks located in the bulk plant.

11.4.7 Each marine motor fuel dispensing facility shall have an attendant or supervisor on duty whenever the facility is open for business. The attendant's primary function shall be to supervise, observe, and control the dispensing of liquids.

11.5 Sources of Ignition.

11.5.1 All electrical components for dispensing liquids shall be installed in accordance with Chapter 8.

11.5.2 All electrical equipment shall be installed and used in accordance with the requirements of NFPA 70, *National Electrical Code* as it applies to wet, damp, and hazardous locations.

11.5.3 Clearly identified emergency electrical disconnects that are readily accessible in case of fire or physical damage at any dispensing unit shall be provided on each marine wharf. The disconnects shall be interlocked to shut off power to all pump motors from any individual location and shall be manually reset only from a master switch. Each such disconnect shall be identified by an approved sign stating EMERGENCY PUMP SHUTOFF in 50 mm (2 in.) red capital letters.

11.5.4 All electrical wiring for power and lighting shall be installed on the side of the wharf opposite from the liquid piping system.

11.5.5 Smoking materials, including matches and lighters, shall not be used within 6 m (20 ft) of areas used for fueling, servicing fuel systems for internal combustion engines, or receiving or dispensing of Class I liquids. Conspicuous NO SMOKING signs shall be posted within sight of the customer being served.

11.5.6 The motors of all equipment being fueled shall be shut off during the fueling operation, except for emergency generators, pumps, and so forth, where continuing operation is essential.

11.6* Bonding and Grounding.

11.6.1* Pipelines on piers shall be bonded and grounded. Bonding and grounding connections on all pipelines shall be located on the pier side of hose riser insulating flanges, if used, and shall be accessible for inspection.

11.6.2 The fuel delivery nozzle shall be put into contact with the vessel fill pipe before the flow of fuel commences and this bonding contact shall be continuously maintained until fuel flow has stopped to avoid possibility of electrostatic discharge.

11.7 Fire Control.

11.7.1 Each marine motor fuel dispensing facility shall be provided with fire extinguishers installed, inspected, and maintained as required by NFPA 10, *Standard for Portable Fire Extinguishers*. Extinguishers for marine motor fuel dispensing areas shall be provided according to the extra (high) hazard requirements for Class B hazards, except that the maximum travel distance to an 80 B:C extinguisher shall be permitted to be 31 m (100 ft).

11.7.2 Piers that extend more than 152 m (500 ft) in travel distance from shore shall be provided with a Class III standpipe that is installed in accordance with NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*

11.7.3 Materials shall not be placed on a pier in such a manner that they obstruct access to fire-fighting equipment or important piping system control valves. Where the pier is accessible to vehicular traffic, an unobstructed roadway to the shore end of the wharf shall be maintained for access by fire-fighting apparatus.

11.8 Containers and Movable Tanks.

11.8.1 The temporary use of movable tanks in conjunction with the dispensing of liquids into the fuel tanks of marine craft on premises not normally accessible to the public shall be permitted. Such installations shall only be made with the approval of the authority having jurisdiction.

11.8.2* Class I or Class II liquids shall not be dispensed into a portable container unless the container is constructed of metal or is approved by the authority having jurisdiction, has a tight closure, and is fitted with a spout or is so designed that the contents can be dispensed without spilling.

11.8.3 Portable containers of 45 L (12 gal) capacity or less shall not be filled while they are in or on a marine craft.

11.9 Cargo Tank Fueling Facilities.

The provisions of Section 11.2 shall not prohibit the dispensing of Class II liquids in the open from a tank vehicle to a marine craft located at commercial, industrial, governmental, or manufacturing establishments when the liquid is intended for fueling marine craft used in connection with those establishments' businesses if the requirements of 11.9.1 through 11.9.7 are met.

11.9.1 An inspection of the premises and operations shall be made and approval granted by the authority having jurisdiction.

11.9.2 The tank vehicle shall comply with the requirements of NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids*.

11.9.3 The dispensing hose shall not exceed 15 m (50 ft) in length.

11.9.4 The dispensing nozzle shall be a listed, automatic-closing type without a latch-open device.

11.9.5 Nighttime deliveries shall only be made in areas deemed adequately lighted by the authority having jurisdiction.

11.9.6 The tank vehicle flasher lights shall be in operation while dispensing.

11.9.7 Fuel expansion space shall be left in each fuel tank to prevent overflow in the event of temperature increase.

11.10 Operating Requirements.

11.10.1 The following shall be the responsibilities of the attendant:

(1) Prevent the dispensing of Class I liquids into portable containers that do not comply with 11.8.2

(2) Be familiar with the dispensing system and emergency shutoff controls

(3) Ensure that the vessel is properly moored and that all connections are made

(4) Be within 4.6 m (15 ft) of the dispensing controls during the fueling operation and maintain a direct, clear, unobstructed view of both the vessel fuel filler neck and the emergency fuel shutoff control

11.10.2 Fueling shall not be undertaken at night except under well-lighted conditions.

11.10.3 During fueling operations, smoking shall be forbidden on board the vessel or marine craft and in the dispensing area.

11.10.4 Before opening the tanks of the vessel to be fueled, the following precautions shall be taken:

(1) All engines, motors, fans, and bilge blowers shall be shut down.

(2) All open flames and smoking material shall be extinguished and all exposed heating elements shall be turned off.

(3) Galley stoves shall be extinguished.

(4) All ports, windows, doors, and hatches shall be closed.

11.10.5 After the flow of fuel has stopped, the following shall occur:

(1) The fill cap shall be tightly secured.

(2) Any spillage shall be wiped up immediately.

(3) If Class I liquid has been delivered, the entire vessel or marine craft shall remain open.

(4) Bilge blowers shall be turned on and allowed to run for at least 5 minutes before starting any engines or lighting galley fires. If bilge blowers are not available, 10 minutes of ventilation shall be required.

11.10.6 No Class I liquids shall be delivered to any vessel having its tanks located below deck unless each tank is equipped with a separate fill pipe, the receiving end of which shall be securely connected to a deck plate and fitted with a screw cap. Such pipe shall extend into the tank. Vessels receiving Class II or Class IIIA liquids shall have the receiving end of the fill pipe securely connected to a deck plate and fitted with a screw cap. Such pipe shall be permitted to connect to a manifold system that extends into each separate tank. Each tank shall be provided with a suitable vent pipe that shall extend from the tank to the outside of the coaming or enclosed rails so that the vapors will dissipate away from the vessel.

11.10.7 Owners or operators shall not offer their vessel or marine craft for fueling unless the following conditions exist:

(1) The tanks being filled are properly vented to dissipate vapors to the outside atmosphere, and the fuel systems are liquidtight and vaportight with respect to all interiors.

(2) All fuel systems are designed, installed, and maintained in compliance with the specifications of the manufacturer of the vessel or marine craft.

(3) Communication has been established between the fueling attendant and the person in control of the vessel or craft receiving the fuel so as to determine the vessel's fuel capacity, the amount of fuel on board, and the amount of fuel to be taken on board.

(4) The electrical bonding and grounding systems of the vessel or craft have been maintained in accordance with the manufacturers' specifications.

11.10.8 A sign with the following legends printed in 50 mm (2 in.) red capital letters on a white background shall be conspicuously posted at the dispensing area:

Before Fueling:

(1) Stop all engines and auxiliaries.

(2) Shut off all electricity, open flames, and heat sources.

(3) Check all bilges for fuel vapors.

(4) Extinguish all smoking materials.

(5) Close access fittings and openings that could allow fuel vapors to enter enclosed spaces of the vessel.

During Fueling:

(1) Maintain nozzle contact with fill pipe.

(2) Wipe up spills immediately.

(3) Avoid overfilling.

(4) Fuel filling nozzle must be attended at all times.

After Fueling:

(1) Inspect bilges for leakage and fuel odors.

(2) Ventilate until odors are removed.

Chapter 12 Additional Requirements for CNG, LNG, Hydrogen, and LPG

12.1 Scope.

This chapter shall apply where CNG, LNG, compressed or liquefied hydrogen, LP-Gas, or combinations of these, are dispensed as motor vehicle fuels along with Class I or Class II liquids that are also dispensed as motor vehicle fuels.

12.2 General Requirements.

12.2.1 The installation and use of CNG and hydrogen systems shall meet the requirements ofNFPA 52, *Vehicular Fuel Systems Code*, except as modified by this chapter. The installation and use of LNG systems shall meet the requirements of NFPA 52, *Vehicular Fuel Systems Code*, except as modified by this chapter. The installation and use of LP-Gas systems shall meet the requirements of NFPA 58, *Liquefied Petroleum Gas Code*, except as modified by this chapter.

12.2.2 A means shall be provided that connects to the dispenser supply piping and that prevents flow in the event that the dispenser is displaced from its mounting.

12.2.3 Dispensing devices for CNG, LNG, and LP-Gas shall be listed.

12.2.4 Listed hose assemblies shall be used to dispense fuel. Hose length at automotive motor fuel dispensing facilities shall not exceed 5.5 m (18 ft).

12.3 Fuel Storage.

12.3.1 Aboveground tanks storing CNG or LNG shall be separated from any adjacent property line that is or can be built upon, any public way, and the nearest important building on the same property by not less than the distances given in Section 8.4 of NFPA 52, *Vehicular Fuel Systems Code*.

12.3.2 Aboveground tanks storing LP-Gas shall be separated from any adjacent property line that is or can be built upon, any public way, and the nearest important building on the same property by not less than the distances given in 3.2.2 of NFPA 58, *Liquefied Petroleum Gas Code*.

12.3.3* Aboveground tanks storing CNG, LNG, or LP-Gas shall be separated from each other by at least 6 m (20 ft) and from dispensing devices that dispense liquid or gaseous motor vehicle fuels by at least 15 m (50 ft).

Exception No. 1: This required separation shall not apply to tanks storing fuels that have the same chemical composition.

Exception No. 2: When both the gaseous fuel storage and dispensing equipment are at least 15 m (50 ft) from any other aboveground motor fuel storage or dispensing equipment, the requirements of NFPA 52, Vehicular Fuel

Systems Code, or NFPA 58, Liquefied Petroleum Gas Code, whichever is applicable, shall apply.

12.3.4 Aboveground storage tanks for the storage of CNG, LNG, or LP-Gas shall be provided with physical protection in accordance with 4.3.7.

12.3.5 Horizontal separation shall not be required between aboveground tanks storing CNG, LNG, or LP-Gas and underground tanks containing Class I or Class II liquids, provided the structural limitations of the underground tanks are not exceeded.

12.4 Dispenser Installations Beneath Canopies.

Where CNG or LNG dispensers are installed beneath a canopy or enclosure, either the canopy or enclosure shall be designed to prevent accumulation or entrapment of ignitable vapors or all electrical equipment installed beneath the canopy or enclosure shall be suitable for Class I, Division 2 hazardous (classified) locations.

12.5 Specific Requirements for LP-Gas Dispensing Devices.

12.5.1 Dispensing devices for LP-Gas shall meet all applicable requirements of NFPA 58, *Liquefied Petroleum Gas Code*, and shall incorporate a dispensing nozzle that releases not more than 2 cm^3 (0.12 $in.^3$) of liquid LP-Gas upon disconnection.

12.5.2 Dispensing devices for LP-Gas shall be located not less than 1.5 m (5 ft) from any dispensing device for Class I liquids.

12.6 Electrical Equipment.

12.6.1 All electrical wiring and electrical utilization equipment shall be of a type specified by, and shall be installed in accordance with, NFPA 70, *National Electrical Code*.

12.6.2* Table 12.6.2 shall be used to delineate and classify areas for the purpose of installation of electrical wiring and electrical utilization equipment.

Table 12.6.2 Electrical Equipment Classified Areas for Dispensing Devices

Dispensing Device	Extent of Classified Area: Class I, Division 1	Extent of Classified Area: Class I, Division 2
Compressed natural gas	Entire space within the dispenser enclosure	1.5 m (5 ft) in all directions from dispenser enclosure
Liquefied natural gas	Entire space within the dispenser enclosure and 1.5 m (5 ft) in all directions from the dispenser enclosure	From 1.5 m (5 ft) to 3 m (10 ft) in all directions from the dispenser enclosure
Liquefied petroleum gas	Entire space within the dispenser enclosure; 46 cm (18 in.) from the exterior surface of the dispenser enclosure to an elevation of 1.22 m (4 ft) above the base of the dispenser; the entire pit or open space beneath the dispenser and within 6 m (20 ft) horizontally from any edge of the dispenser when the pit or trench is not mechanically ventilated	Up to 46 cm (18 in.) above ground and within 6 m (20 ft) horizontally from any edge of the dispenser enclosure, including pits or trenches within this area when provided with adequate mechanical ventilation

Chapter 13 Farms and Remote Sites

13.1 Scope.

This chapter shall apply to the storage of Class I flammable liquids and Class II and Class IIIA combustible liquids, as herein defined, in containers or tanks that do not exceed 4164 L (1100 gal) individual capacity:

(1) On farms

(2) At isolated construction sites and isolated earth-moving projects, including gravel pits, quarries, and borrow pits, where, in the opinion of the authority having jurisdiction, it is not necessary to comply with the more restrictive requirements of this code and NFPA 30, *Flammable and Combustible Liquids Code*

(3) At any private site where temporary use makes it unnecessary, in the opinion of the authority having jurisdiction, to comply with the more restrictive requirements of this code and NFPA 30, *Flammable and Combustible Liquids Code*

13.2 Approved Storage.

13.2.1 Storage of liquids, as covered by this chapter, shall be permitted in either of the following:

(1) Containers that meet the requirements of Chapter 9 of NFPA 30, *Flammable and Combustible Liquids Code*, do not exceed 227 L (60 gal), and meet the requirements of 13.2.2

(2) Permanent aboveground storage tanks of more than 227 L (60 gal) but not more than 4158 L (1100 gal) individual capacity or capacities that meet the requirements of 13.2.3

13.2.2 Individual Containers Not Exceeding 227 L (60 gal) Capacity.

13.2.2.1 Dispensing or transfer devices that require the container to be pressurized shall meet the requirements of Chapter 17 of NFPA 30, *Flammable and Combustible Liquids Code*.

13.2.2.2 Electrical equipment, wiring, and classified locations shall be in compliance with Chapter 8.

13.2.2.3 Pumping devices and faucets shall be well maintained to prevent leakage.

13.2.2.4 Individual containers shall not be interconnected or manifolded and shall be kept tightly closed when not in use.

13.2.2.5 Containers used for the storage of Class I liquids shall be kept outside and at least 3 m (10 ft) from any building.

13.2.2.6 Containers shall be permitted to be stored inside a building if the building is used exclusively for the storage of Class I and Class II liquids, is located at least 3 m (10 ft) from any other building, and is provided with cross ventilation using at least two vents, each having a net open area of at least 645 mm^2 (64 $in.^2$) and each placed at floor level. The vents shall be located opposite from each other.

13.2.3 Tanks to 4158 L (1100 gal) Capacity.

13.2.3.1 Tanks shall be of single-compartment design and meet the requirements of 21.3 and 21.4 of NFPA 30, *Flammable and Combustible Liquids Code*.

13.2.3.2 Tanks shall be a minimum 12-gauge plate thickness.

13.2.3.3 Each tank shall be provided with a fill opening that is equipped with a closure that is designed to be locked. The fill opening shall be separate from the vent opening.

13.2.3.4* Each tank shall be provided with a free-opening vent that shall relieve either the vacuum or the pressure that might develop during normal operation or fire exposure. The vent shall have the nominal pipe sizes listed in Table 13.2.3.4.

Table 13.2.3.4 Required Vent Diameter

Tank Capacity		Vent Diameter	
L	**gal**	**mm**	**in.**
Up to 1040	Up to 275	38	1½
1040 to 2500	275 to 660	51	2
2501 to 3410	661 to 900	64	2½
3411 to 4165	901 to 1100	76	3

13.2.3.5 Vents shall be arranged to discharge so as to prevent localized overheating of, or direct flame impingement on, any part of the tank in the event that vapors from the vent are ignited.

13.2.3.6 Tanks shall be located outside and at least 12 m (40 ft) from any important building. Tanks shall also be located so that any vehicle, equipment, or container that is filled directly from the tanks is at least 12 m (40 ft) from any important building.

13.2.3.7 Tanks shall be permitted to have top openings only or shall be permitted to be elevated for gravity discharge.

13.2.3.8 Each tank shall be provided with a listed emergency vent that meets the requirements of Section 22.7 of NFPA 30, *Flammable and Combustible Liquids Code*.

13.2.3.9 Tanks that have top openings only shall be mounted and equipped as follows:

(1)* Stationary tanks shall be mounted on concrete, steel, or masonry supports at least 150 mm (6 in.) in height so as to protect the bottom of the tank from corrosion due to contact with the ground and to maintain the tank in a stable position.

(2) Movable tanks shall be equipped with attached metal legs that rest on shoes or runners designed so that the tank is supported in a stable position and so that the tank and its supports can be moved as a single unit.

(3) Tanks shall be equipped with a tightly and permanently attached approved pumping device having an approved hose and nozzle.

(4) Each component of dispensing systems for Class I liquids shall be listed.

(5) The dispenser nozzle and hose shall be designed so they can be padlocked to the hanger to prevent tampering.

(6) The pump discharge shall be equipped with an effective anti-siphoning device, or the discharge hose shall be equipped with an approved self-closing nozzle.

(7) Siphons or internal pressure discharge devices shall be prohibited.

13.2.3.10 Tanks elevated for gravity discharge shall be mounted and equipped as follows:

(1) Tanks shall be supported on masonry, concrete, or steel supports having adequate strength and designed to provide stability.

(2) Discharge connections shall be made to the bottom or to the end of the tank.

(3) The discharge connection shall be equipped with a valve that shall automatically close in the event of a fire by means of operation of an effective heat-actuated device. This valve shall be located adjacent to the tank shell. If this valve cannot be operated manually, an additional valve that can be manually operated shall be provided.

(4) Each component of dispensing systems for Class I liquids shall be listed.

(5) The nozzle shall be equipped so that it can be padlocked to its hanger to prevent tampering.

(6) Hose used for dispensing Class II and III liquids shall be equipped with listed self-closing nozzles.

13.2.3.11 Individual tanks shall not be interconnected or manifolded.

13.2.3.12 Tanks shall be separated from each other by not less than 0.9 m (3 ft).

13.3 Marking of Tanks and Containers.

Tanks and containers shall be conspicuously marked with the name of the product contained and with the following marking:

FLAMMABLE — KEEP FIRE AND FLAME AWAY.

13.4 Fire Prevention and Control.

13.4.1 Storage areas shall be kept free of weeds and other combustible materials.

13.4.2 Open flames and smoking materials shall not be permitted in areas where Class I liquids are stored and/or dispensed.

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1 This code, known as the *Code for Motor Fuel Dispensing Facilities and Repair Garages*, is recommended for use as the basis for legal regulations. Its provisions are intended to reduce the hazards of motor fuels to a degree consistent with reasonable public safety, without undue interference with public convenience and necessity. Thus, compliance with this code does not eliminate all hazards in the use of these fuels.

See the *Flammable and Combustible Liquids Code Handbook* for additional explanatory information.

A.1.1.2 See NFPA 52, *Vehicular Fuel Systems Code*, and NFPA 58, *Liquefied Petroleum Gas Code*, for requirements for facilities where only these fuels are dispensed.

A.1.2 See NFPA 302, *Fire Protection Standard for Pleasure and Commercial Motor Craft*, for safety precautions while fueling at marine motor fuel dispensing facilities, and NFPA 303, *Fire Protection Standard for Marinas and Boatyards*, for additional requirements applicable to marine motor fuel dispensing facilities.

A.1.7 The classification of liquids is based on flash points that have been corrected to sea level, in accordance with the relevant ASTM test procedures. At high altitudes, the actual flash points will be significantly lower than those either observed at sea level or corrected to atmospheric pressure at sea level. Allowances could be necessary for this difference in order to appropriately assess the risk.

Table A.1.7 presents a comparison of the definitions and classification of flammable and combustible liquids, as set forth in Section 1.7 of this code, with similar definitions and classification systems used by other regulatory bodies.

The Hazardous Materials Regulations of the U.S. Department of Transportation (DOT), as set forth in 49 CFR 173.120(b)(2) and 173.150(f), provide an exception whereby a flammable liquid that has a flash point between 37.8°C (100°F) and 60.5°C (141°F) and does not also meet the definition of any other DOT hazard class, can be reclassified as a combustible liquid [i.e., one having a flash point above 60.5°C (141°F)] for shipment by road or rail within the United States.

Table A.1.7 Comparative Classification of Liquids

Agency	Agency Classification	Agency Flash Point °F	Agency Flash Point °C	NFPA Definition	NFPA Classification	NFPA Flash Poi °F	
ANSI/CMA Z129.1-1994	Flammable	<141	<60.5	Flammable	Class I	<100	
				Combustible	Class II	≥100 to <140	≥3
					Class IIIA	≥140 to <200	≥6
	Combustible	≥141 to <200	≥60.5 to <93	Combustible	Class IIIA	≥140 to <200	≥6
DOT	Flammable	<141	<60.5	Flammable	Class I	<100	
				Combustible	Class II	≥100 to <140	≥3
					Class IIIA	≥140 to <200	≥6
	Combustible	≥141 to <200	≥60.5 to <93	Combustible	Class IIIA	≥140 to <200	≥6
DOT HM-181 Domestic Exemption*	Flammable	<100	<37.8	Flammable	Class I	<100	
	Combustible	≥100 to <200	≥37.8 to <93	Combustible	Class II	≥100 to <140	≥3
					Class IIIA	≥140 to <200	≥6
UN	Flammable	<141	<60.5	Flammable	Class I	<100	
				Combustible	Class II	≥100 to <140	≥3
					Class IIIA	≥140 to <200	≥6
	Combustible	≥141 to <200	≥60.5 to <93	Combustible	Class II	≥100 to <140	≥3
					Class IIIA	≥140 to <200	≥6
OSHA	Flammable	<100	<37.8	Flammable	Class I	<100	

Table A.1.7 Comparative Classification of Liquids

Agency	Agency Classification	Agency Flash Point °F	Agency Flash Point °C	NFPA Definition	NFPA Classification	NFPA Flash Poi[nt] °F	
	Combustible†	≥100	≥37.8	Combustible	Class II	≥100 to <140	≥3
					Class IIIA	≥140 to <200	≥6
					Class IIIB2	≥200	

*See A.1.7.3 of NFPA 30.

†See 29 CFR 1910.106 for Class IIIB liquid exemptions.

A.1.7.2 For the purposes of this code, a material with a Reid Vapor Pressure greater than 2068 mm Hg absolute (40 psia) is considered to be a gas and is, therefore, not within the scope of NFPA 30A. See NFPA 58, *Liquefied Petroleum Gas Code*.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.2.3 Code. The decision to designate a standard as a "code" is based on such factors as the size and scope of the document, its intended use and form of adoption, and whether it contains substantial enforcement and administrative provisions.

A.3.2.5 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A.3.3.5 Container. Containers include, but are not limited to, bags, barrels, cans, cartons, cylinders, drums, and tanks.

A.3.3.6 Dispensing Device, Overhead Type. This definition applies to an overhead dispenser that uses a retractable hose on an overhead reel, as distinguished from the now-common dispensing device that has one or more hose outlets located in a canopy at the top of the dispensing device. The latter, also called *high-hose units* or *multi-product dispensers*, are treated by NFPA 30A as conventional dispensing devices.

A.3.3.9 Liquid. For the purposes of this code, liquefied natural gas (LNG) and liquefied petroleum gas (LP-Gas) are not considered liquids.

A.3.3.9.1 Combustible Liquid. See Annex B for information about typical liquids found at motor fuel dispensing facilities.

A.3.3.9.2 Flammable Liquid. See Annex B for information about typical liquids found at motor fuel dispensing facilities.

A.3.3.11.5 Motor Fuel Dispensing Facility Located Inside a Building. The motor fuel dispensing facility can be either enclosed or partially enclosed by the building walls, floors, ceilings, or partitions or can be open to the outside. The motor fuel dispensing area is that area required for dispensing of fuels to motor vehicles. Dispensing of fuel at manufacturing, assembly, and testing operations is not included within this definition.

A.3.3.15.4 Protected Aboveground Tank. See SWRI 93, *Testing Requirements for Protected Aboveground Flammable Liquid Fuel Storage Tanks,* for more information.

A.3.3.17 Vapor Processing System. Examples are systems using blower-assist for capturing vapors and refrigeration, absorption, and combustion systems for processing vapors.

A.3.3.18 Vapor Recovery System. Examples are balanced-pressure vapor displacement systems and vacuum-assist systems without vapor processing.

A.4.3.2 PEI RP200, *Recommended Practices for Installation of Aboveground Storage Systems for Motor Vehicle Fueling,* also provides information on this subject.

A.4.3.3.3 Some of the specifications for vault design and construction include the following:

(1) The walls and floor of the vault are to be constructed of reinforced concrete at least 6 in. (50 mm) thick.

(2) The top and floor of the vault and the tank foundation must be designed to withstand all anticipated loading, including loading from vehicular traffic, where applicable.

(3) The walls and floor of a belowgrade vault must be designed to withstand anticipated soil and hydrostatic loading.

(4) The vault must be liquidtight.

(5) The vault enclosure must have no openings except those necessary for access to, inspection of, and filling, emptying, and venting of the tank.

(6) The vault shall be provided with connections to permit ventilation to dilute, disperse, and remove any vapors prior to personnel entering the vault.

(7) The vault must be provided with a means for personnel entry.

(8) The vault must be provided with an approved means to admit a fire suppression agent. [**30:** A.25.5]

A.4.3.7.2 The top of the posts should be set not less than 0.9 m (3 ft) above ground and should be located not less than 1.5 m (5 ft) from the tank. Other approved means to protect tanks subject to vehicular damage include vehicle impact resistance testing such as that prescribed in UL 2085, *Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids*, for protected aboveground tanks.

A.4.3.8 Appropriate corrosion control standards include the following:

(1) STI RP 892-91, *Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems*

(2) STI RP-01-69, *Recommended Practice for Control of External Corrosion of Underground or Submerged Metallic Piping Systems*

(3) STI RP 1632, *Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems*

A.5.4.2 When testing with air, the pressure should be maintained at the initial pressure setting or within a range that can be accounted for by temperature changes held for a minimum of 1 hour.

A.6.6.2 The flow of fuel can be stopped by dispensers used in self-serve motor fuel dispensing facilities. The nozzle can be returned to the dispenser in the latched-open position. Subsequent activation of the dispenser would then immediately release fuel from the latched-open nozzle, creating a hazardous situation.

A.7.3.5.1 Additional fire protection considerations can include items such as fixed suppression systems, automatic fire detection, manual fire alarm stations, transmission of alarms to off-site locations, and limiting volume delivered per transaction.

A.7.3.6.7 Natural ventilation can normally be expected to dissipate any fuel vapors before they reach ignitible concentrations if at least two sides of the dispensing area are open to the building exterior.

A.7.3.6.9 Oil/water separators might not be designed to remove or separate flammable or combustible liquids other than oil.

A.7.5 The ventilation requirements contained in this section do not consider exhaust emissions from motor vehicle engines. An appropriate professional should be consulted to determine precautions necessary to protect against this health hazard.

A.7.5.1 Manual control switches for supply and exhaust ventilating systems should be located close to the entrance to the area served. In buildings protected by automatic sprinklers or fire alarm systems, it is recommended that the necessary interlocks be provided to shut down supply and exhaust fans when the sprinklers or fire alarms operate. For service facilities for CNG-fueled vehicles and LNG-fueled vehicles, see NFPA 52, *Vehicular Fuel Systems Code*.

A.7.6.6 Enclosed rooms or spaces storing CNG- or LNG-fueled vehicles should prohibit the transmission of gases to other areas of the building. Other areas outside of the enclosure, if not used for repairing or storing CNG- or LNG-fueled vehicles, can use other heating methods. Note that, according to A.1.1 of NFPA 52, *Vehicular Fuel Systems Code*, CNG weighs about two-thirds as much as air and, therefore, as a gas, will rise in a room. LNG at a temperature of less than or equal to –112°C (–170°F) is heavier than ambient air [at 15°C (60°F)], but as the LNG's temperature rises, the gas becomes lighter than air. Determination of the potential for gas accumulation should be based on an engineering analysis. (Guidance for classification of hazardous locations is available in NFPA 497, *Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified)*

Locations for Electrical Installations in Chemical Process Areas.)

A.7.7 Dynamic automotive emissions testing equipment located in stand-alone facilities dedicated to such equipment can qualify as being in an unclassified location and not subject to the special rules of Article 511 of NFPA 70, *National Electrical Code*. The same type of equipment, however, when installed within most repair garages, especially when located in a pit, has to be suitable for location within a Class I, Division 1 or Division 2 hazardous location as defined in 511.3(B) of NFPA 70, *National Electrical Code*.

A.8.2.1 The intent is that the electrical utilization equipment be placed below a volume located at the highest area of the building that is equal to 150 percent of the released volume of the largest CNG tank.

A.8.3.1 The designation of classes and divisions of classified locations is defined Article 500 of NFPA 70, *National Electrical Code*.

A.8.5.2 NFPA 77, *Recommended Practice on Static Electricity*, contains information on this subject.

A.9.2.1 API RP 1621, *Recommended Practice for Bulk Liquid Stock Control at Retail Outlets*, provides information on this subject.

A.9.2.3.1 See Chapter 9 of NFPA 30, *Flammable and Combustible Liquids Code*, for further information.

A.9.2.5.4 The following language includes both the mandatory requirements and some optional text that could be used to comply with the requirements in 9.2.5.4:

WARNING

It is unlawful and dangerous to dispense gasoline into unapproved containers.
No smoking.
Stop motor.
No filling of portable containers in or on a motor vehicle.
Place container on ground before filling.
Discharge your static electricity before fueling by touching a metal surface away from the nozzle.
Before using pump, touch any metal on the car away from your vehicle's fuel filler with bare hand. This will discharge static electricity on your body. Failure to fully discharge may ignite gasoline vapors.
Do not re-enter your vehicle while gasoline is pumping. This can re-charge your body with static electricity. If you must re-enter your vehicle, discharge static electricity again before touching the pump nozzle.
If a fire starts, **do not** remove nozzle — back away immediately and tell attendant. If no attendant is on site, use the emergency shut-off button to stop pump.
Do not allow individuals under licensed age to use the pump.
Only persons of licensed age should use pump.
Keep children away from the pump area.
Do not allow children to use pump.

A.9.5.6 Additional fire protection considerations can include fixed suppression systems, automatic fire detection, manual fire alarm stations, transmission of alarms to off-site locations, and limitation of the quantity of motor fuel delivered per transaction.

A.9.7.2.3 The ground wire should never be attached to the chassis if welding a fender, as the electrical resistance between the two could be sufficient to cause a fire or personal injury. The monorail and hoist should not be used as the ground side for the same reason.

A.11.2.2 Cases where the length of the supply line to dispensing devices would result in insufficient pressure for operational purposes or would increase the potential for leakage due to the increased number of fittings or exposure of the line can warrant location of the supply on the pier.

A.11.6 Where excessive stray currents are encountered, piping handling Class I and Class II liquids should be electrically isolated from the shore piping. This requirement prevents stray currents originating in the vessel's electrical system from causing an electrical arc or spark.

A.11.6.1 NFPA 77, *Recommended Practice on Static Electricity*, contains information on this subject.

A.11.8.2 See Section 9.4 of NFPA 30, *Flammable and Combustible Liquids Code*, for further information.

A.12.3.3 The selection of the 15 m (50 ft) separation distance for gaseous fuels is based on the existing separation requirements prescribed in NFPA 30A. No technical data were available to support different separation distances, and the 15 m (50 ft) distance was considered reasonable and conservative, based on the information available to the technical committee at the time.

A.12.6.2 The designation of classes and divisions of classified locations is defined in Article 500 of NFPA 70, *National Electrical Code*.

A.13.2.3.4 Vent sizes are based on limiting the internal pressure of the tank to a gauge pressure of 20.7 kPa (3.0 psi) [i.e., 120 percent of a gauge pressure of 17.2 kPa (2.5 psi)], which is the maximum internal pressure allowed for an atmospheric storage tank. This is based on an orifice coefficient of 0.8 and an environmental factor of 0.5. The 0.5 environmental factor recognizes the limited time that a small tank will be exposed to fire, loss of fuel by absorption into the soil, and drainage of liquid away from the tank. Calculations are based on 22.7.3 of NFPA 30, *Flammable and Combustible Liquids Code*.

A.13.2.3.9(1) Timber supports are permitted in the exception to Section 22.5 of NFPA 30, *Flammable and Combustible Liquids Code*, and as extracted in NFPA 1, *Uniform Fire Code*.

Annex B Typical Flammable and Combustible Liquids Found at Motor Fuel Dispensing Facilities

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

B.1 Fire Hazard Properties of Typical Flammable and Combustible Liquids Found at Motor Fuel Dispensing Facilities.

Table B.1 lists common liquids typically found at motor fuel dispensing facilities and repair garages and their relevant fire hazard properties.

Table B.1 Typical Flammable and Combustible Liquids Found at Motor Fuel Dispensing Facilities

Facilities.

Table B.1 lists common liquids typically found at motor fuel dispensing facilities and repair garages and their relevant fire hazard properties.

Table B.1 Typical Flammable and Combustible Liquids Found at Motor Fuel Dispensing Facilities

Liquid	Flash Point (°F)	NFPA 30 Class	Boiling Point (°F)	Min. Ignition Temp. in Air (°F)
Antifreeze	230	IIIB	300	—
Brake fluid	300	IIIB	540	—
Chassis grease	400	IIIB	>800	>800
Crankcase drainings	—	IIIB	—	—
Diesel fuel #1	100	II	—	—
Diesel fuel #2	125	II	—	—
Diesel fuel #4	130	II	—	—
Gasoline	-40 to -50	IB	100 to 400	~825
Gear lubricant	395	IIIB	>800	>800
Kerosene (fuel oil #1)	100	II	304 to 574	440
Lithium-moly grease	380	IIIB	>800	>900
Lubricating oils	300 to 450	IIIB		
Power steering fluid	350	IIIB	>550	—
Transmission fluid				
Dexron II	395	IIIB	>800	>800
Type F	380	IIIB	>800	>800
White grease	465	IIIB	>800	>800
Windshield washer fluid (methanol/water mixtures)				
100% methanol	54	IB	148	725
50% methanol/50% water	80	IB	—	
29% methanol/71% water	102	II	178	867
20% methanol/80% water	118	II	—	
5% methanol/95% water	206	IIIB	—	

For SI units, °C = (°F – 32)/1.8.

Annex C Sample Ordinance Adopting NFPA 30A

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

C.1

The following sample ordinance is provided to assist a jurisdiction in the adoption of this code and is not part of this code.

ORDINANCE NO. ____________

An ordinance of the *[jurisdiction]* adopting the *[year]* edition of that *[code, standard]*; NFPA *[document number]*, *[complete document title]*, and documents listed in Chapter 2 of that *[code, standard]*; prescribing regulations governing conditions hazardous to life and property from fire or explosion; providing for the issuance of permits and collection of fees; repealing Ordinance No. _______ of the *[jurisdiction]* and all other ordinances and parts of ordinances in conflict therewith; providing a penalty; providing a severability clause; and providing for publication; and providing an effective date.

BE IT ORDAINED BY THE *[governing body]* OF THE *[jurisdiction]*:

SECTION 1 That the *[complete document title]*, and documents adopted by Chapter 2, three (3) copies of which are on file and are open to inspection by the public in the office of the *[jurisdiction's keeper of records]* of the *[jurisdiction]*, are hereby adopted and incorporated into this ordinance as fully as if set out at length herein, and from the date on which this ordinance shall take effect, the provisions thereof shall be controlling within the limits of the *[jurisdiction]*. The same are hereby adopted as the *[code, standard]* of the *[jurisdiction]* for the purpose of prescribing regulations governing conditions hazardous to life and property from fire or explosion and providing for issuance of permits and collection of fees.

SECTION 2 Any person who shall violate any provision of this code or standard hereby adopted or fail to comply therewith; or who shall violate or fail to comply with any order made thereunder; or who shall build in violation of any detailed statement of specifications or plans submitted and approved thereunder; or failed to operate in accordance with any certificate or permit issued thereunder; and from which no appeal has been taken; or who shall fail to comply with such an order as affirmed or modified by or by a court of competent jurisdiction, within the time fixed herein, shall severally for each and every such violation and noncompliance, respectively, be guilty of a misdemeanor, punishable by a fine of not less than $ _____ nor more than $_____ or by imprisonment for not less than ______ days nor more than ______ days or by both such fine and imprisonment. The imposition of one penalty for any violation shall not excuse the violation or permit it to continue; and all such persons shall be required to correct or remedy such violations or defects within a reasonable time; and when not otherwise specified the application of the above penalty shall not be held to prevent the enforced removal of prohibited conditions. Each day that prohibited conditions are maintained shall constitute a separate offense.

SECTION 3 Additions, insertions, and changes — that the *[year]* edition of *[document number]*, *[complete document title]*, is amended and changed in the following respects:

List Amendments

SECTION 4 That ordinance No. _________ of *[jurisdiction]* entitled *[fill in the title of the ordinance or ordinances in effect at the present time]* and all other ordinances or parts of ordinances in conflict herewith are hereby repealed.

SECTION 5 That if any section, subsection, sentence, clause, or phrase of this ordinance is, for any reason, held to be invalid or unconstitutional, such decision shall not affect the validity or constitutionality of the remaining portions of this ordinance. The *[governing body]* hereby declares that it would have passed this ordinance, and each section, subsection, clause, or phrase hereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses, and phrases be declared unconstitutional.

SECTION 6 That the *[jurisdiction's keeper of records]* is hereby ordered and directed to cause this ordinance to be published.

[NOTE: An additional provision may be required to direct the number of times the ordinance is to be published and to specify that it is to be in a newspaper in general circulation. Posting may also be required.]

SECTION 7 That this ordinance and the rules, regulations, provisions, requirements, orders, and matters established and adopted hereby shall take effect and be in full force and effect *[time period]* from and after the date of its final passage and adoption.

Annex D Informational References

D.1 Referenced Publications.

The documents or portions thereof listed in this annex are referenced within the informational sections of this code and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

D.1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1, *Uniform Fire Code*™, 2006 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 2008 edition.

NFPA 52, *Vehicular Fuel Systems Code*, 2006 edition.

NFPA 58, *Liquefied Petroleum Gas Code*, 2008 edition.

NFPA 70, *National Electrical Code*®, 2008 edition.

NFPA 77, *Recommended Practice on Static Electricity*, 2007 edition.

NFPA 302, *Fire Protection Standard for Pleasure and Commercial Motor Craft*, 2004 edition.

NFPA 303, *Fire Protection Standard for Marinas and Boatyards*, 2006 edition.

NFPA 497, *Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*, 2004 edition.

Flammable and Combustible Liquids Code Handbook, 1996 edition.

D.1.2 Other Publications.

D.1.2.1 API Publications. American Petroleum Institute, 1220 L Street, N.W., Washington, DC 20005-4070.

API RP 1621, *Recommended Practice for Bulk Liquid Stock Control at Retail Outlets*, 1993.

D.1.2.2 PEI Publications. Petroleum Equipment Institute, P.O. Box 2380, Tulsa, OK 74101–2380.

PEI RP200, *Recommended Practices for Installation of Aboveground Storage Systems for Motor Vehicle Fueling*, 1996.

D.1.2.3 STI Publications. Steel Tank Institute, 570 Oak Wood Road, Lake Zurich, IL 60047.

STI RP 01-69, *Recommended Practice for Control of External Corrosion of Underground or Submerged Metallic Piping Systems*.

STI RP 892-91, *Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems*.

STI RP 1632, *Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems*.

D.1.2.4 SWRI Publications. Southwest Research Institute, 6220 Culebra Road, Drawer 28510, San Antonio, TX 78228-0510.

SWRI 93, *Testing Requirements for Protected Aboveground Flammable Liquid Fuel Storage Tanks*, 2001 edition.

D.1.2.5 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 2085, *Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids*, 1997, Revised December 1999.

D.1.2.6 U.S. Government Publications. U. S. Government Printing Office, Washington, DC 20402.

Title 29, Code of Federal Regulations, Part 1910.106.

Title 49, Code of Federal Regulations, Part 173.

D.2 Informational References. (Reserved)

D.3 References for Extracts in Informational Sections.

NFPA 30, *Flammable and Combustible Liquids Code*, 2008 edition.

Formal Interpretations

Formal Interpretation

NFPA 30A

Motor Fuel Dispensing Facilities and Repair Garages

2008 Edition

Reference: 4.3.2.7
F.I. 90-1

Background: Paragraph 4.3.2.7 states that a fuel dispensing system that is supplied by an aboveground tank shall not exceed 6,000 gallons. However, it does not indicate if this limit applies to the individual tank system or to the aggregate quantity of Class I and Class II liquids in a multitank system. The *Flammable and Combustible Liquids Code Handbook*, fourth edition, indicates that two tanks are allowed where the operator requires two classes of fuel: Class I (gasoline) and Class II (diesel fuel).

Question: Is it the intent of 4.3.2.7 to allow the installation of two tank/fuel dispensing systems, each having a maximum capacity of 6,000 gallons when one system contains a Class I liquid such as gasoline and the other system contains a Class II liquid such as diesel fuel?

Answer: Yes.

Issue Edition: 1990
Reference: 9-3.5
Issue Date: May 14, 1992
Effective Date: June 3, 1992

Formal Interpretation

NFPA 30A

Motor Fuel Dispensing Facilities and Repair Garages

2008 Edition

Reference: 4.3.5.2
F.I. 93-1 (NFPA 30A)

Question: Is Paragraph 4.3.5.2 intended to apply to an emergency vent that is installed on an enclosed secondary containment that is provided as an adjunct to a fire-resistant tank?

Answer: Yes.

Issue Edition: 1993
Reference: 2-4.5(f)
Issue Date: March 7, 1995
Effective Date: March 27, 1995

Formal Interpretation

NFPA 30A

Automotive and Marine Service Station Code

2008 Edition

Reference: 9.2.2
F.I. No.: 30A-03-1

Question: Does paragraph 9.2.2.5 apply to delivery operations describe in 9.2.2.1?

Answer: Yes.

Issue Edition: 2003
Reference: 9.2.2
Issue Date: September 9, 2005
Effective Date: September 29, 2005

Formal Interpretation

NFPA 30A

Motor Fuel Dispensing Facilities and Repair Garages

2008 Edition

Reference: 11.3.4
F.I. No.: 96-1 (NFPA 30A)

Question No. 1: Is the intent of Subsection11.3.4 of NFPA 30A to permit the use of oil-resistant flexible hose that extends from the shore piping to a dispensing device located on the end of a long floating structure?

Answer: No.

Question No. 2: If the answer to Question No. 1 is "No", is it the intent of Subsection 11.3.4 of NFPA 30A for a floating dock to utilize a piece of oil-resistant flexible hose at each section of the dock, with piping installed on each section of the dock?

Answer: Yes.

Question No. 3: Is it the intent of Subsection 11.3.4 of NFPA 30A to permit the use of flexible nonmetallic piping with secondary containment and listed for underground installation to be installed exposed on the surface along a floating structure?

Answer: No.

Issue Edition: 1996
Reference: 10-3.2
Issue Date: August 27, 1999
Effective Date: September 15, 1999

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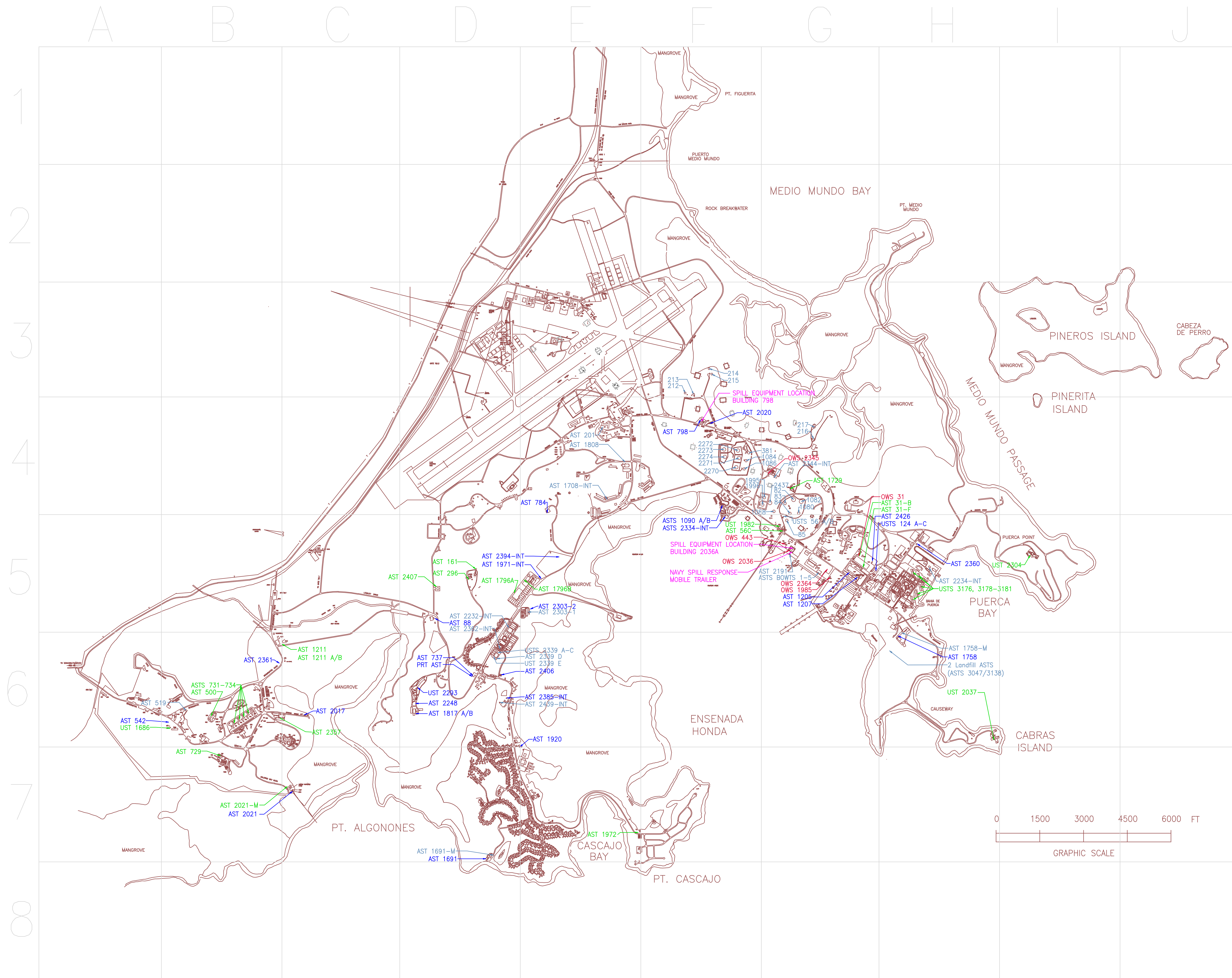
APPENDIX B
FACILITY AND AREA MAPS

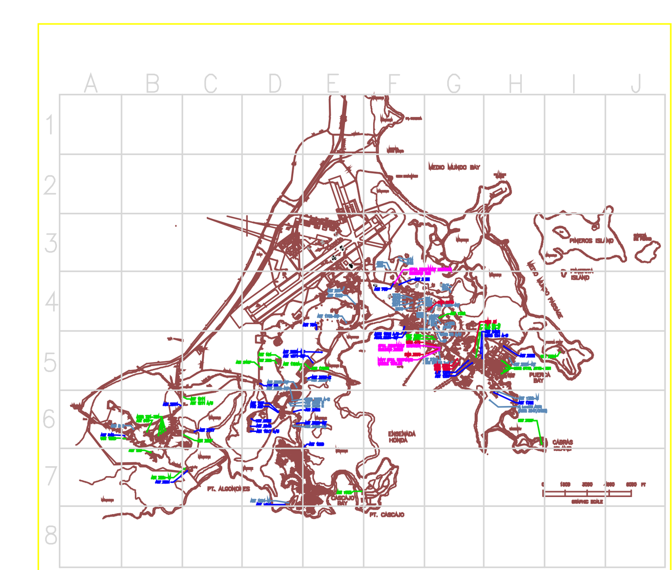
111626_69_00.dwg

FIGURE 1-1
REGIONAL LOCATION MAP
NAVAL ACTIVITY PUERTO RICO
SPILL PROTECTION, CONTROL, AND COUNTERMEASURE PLAN

SOURCE: METRODATA, INC., 1999.

NAVAL ACTIVITY PUERTO RICO





Active Tanks	
Inactive Tanks	
Closed Tanks	
Oil/Water Seperators	
Spill Response Equipment	

DATE	December 2010
DRAWN	JO
REVIEWED	JO
S.O.#	119197
CADD#	24500120

NORTH

SPCC PLAN
NAVAL ACTIVITY PUERTO RICO
CEIBA, PUERTO RICO

MICHAEL BAKER JR, INC.
VIRGINIA BEACH, VIRGINIA

Baker

TANK LOCATION MAP

SCALE 1" = 1600'

DATE December 2010

FIGURE 1–2

REVISIONS		
	DATE	November 2010
	SCALE	1"=1600'
	DRAWN	JO
	REVIEWED	JO
	S.O.#	119197
	CADD#	24500120

NORTH

SPCC PLAN
NAVAL ACTIVITY PUERTO RICO
CEIBA, PUERTO RICO

MICHAEL BAKER JR, INC.
VIRGINIA BEACH, VIRGINIA

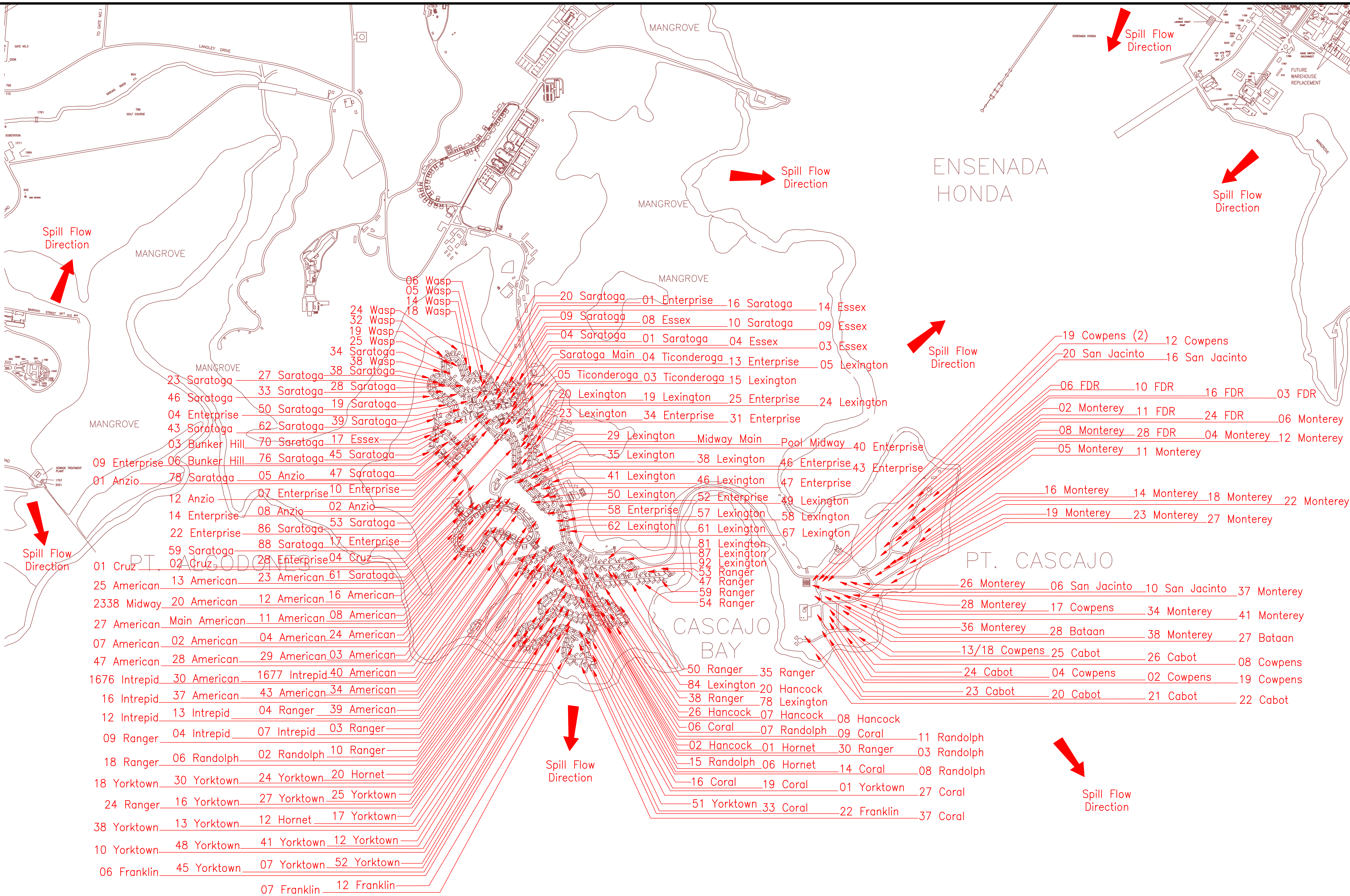
Baker

GENERAL TRANSFORMER AND
OPERATIONAL EQUIPMENT LOCATION MAP

SCALE 1" = 1600'

DATE DECEMBER 2010

FIGURE
1-3



REVISIONS		
	DATE	November 2010
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NORTH

SPCC PLAN
NAVAL ACTIVITY PUERTO RICO
CEIBA, PUERTO RICO

MICHAEL BAKER JR, INC.
VIRGINIA BEACH, VIRGINIA

Baker

HOUSING TRANSFORMER LOCATION MAP

SCALE 1" = 1600'

DATE DECEMBER 2010

FIGURE 1-4

APPENDIX C
SPILL RATE, QUANTITY, AND PATHWAY ESTIMATION

SPILL RATE, QUANTITY, AND PATHWAY ESTIMATION

ASSUMPTIONS:

Reasonable expectations rather worst-case scenarios.

40 CFR 112.7(b) calls for information on spills from tanks rather than spills escaping from the facility; any facility in compliance with the regulation would have no spill escaping the facility since it would be retained in secondary containment.

Manifolded tanks are equivalent to a single tank whose capacity of the sum of all the tanks piped together; leak in one tank could drain all.

ESTIMATION OF FLOW RATE:

Use units of gallons and minutes in all calculations.

Convert all truck pumping rates and piping delivery rates to gallons per minute (gpm) using Conversion to Gallons Per Minute (gpm) chart below.

Use Estimation of Flow Rate chart below to determine rates for the facility.

ESTIMATION OF TOTAL QUANTITY:

Use Estimation of Total Quantity Discharged chart below to determine total quantity discharged for the facility.

ESTIMATION OF PATHWAYS:

The facility must be walked and pathways from each tank to navigable waters marked on a field copy of an appropriate map. Topographic maps should never be the sole source of pathways; they do not show ditches, curbs, drains, and other features obvious to a field observer that would direct flow.

CONVERSION TO GALLONS PER MINUTE (gpm)	
GIVEN	MULTIPLY BY
bbl/hr	.7
gal/hr	.0167

ESTIMATION OF FLOW RATE	
FAILURE TYPE	ESTIMATED FLOW RATE
OVERFILL: (via tank truck)	RATE = MAXIMUM TRUCK PUMPING RATE The highest pumping rate the supplier's trucks are capable of.
OVERFILL: (via piping)	RATE = MAXIMUM PIPING DELIVERY RATE The highest rate the supplying piping can actually delivery "oil" to the facility at. The smaller the supplying piping, the lower the percentage of rated supply pump capacity that can actually be delivered (i.e., a 675 gpm pump may deliver 500 gpm via a 10" pipe, but only 200 gpm via a 4" pipe).
RUPTURE:	RATE = <u>CAPACITY OF LARGEST TANK</u> 60 minutes Assume the largest tank (or manifolded tank set) in the facility will empty in 60 minutes.
LEAKAGE:	RATE = <u>CAPACITY OF LARGEST TANK</u> 10,080 minutes Assume the largest tank (or manifolded tank set) in the facility will empty in a week (10,080 minutes)
FAULTY PIPING, ETC:	RATE = <u>CAPACITY OF LARGEST TANK</u> 1440 minutes Assume the largest tank (or manifolded tank set) in the facility will empty in a day (1440 minutes)

ESTIMATION OF TOTAL QUANTITY DISCHARGED	
FAILURE TYPE	ESTIMATED TOTAL QUANTITY DISCHARGED
OVERFILL: (via tank truck)	DISCHARGE = (MAXIMUM TRUCK PUMPING RATE IN GALLONS PER MINUTE) X (1 minute) One minute of pumping at the highest pumping rate the supplier's trucks are capable of.
OVERFILL: (via pipeline)	DISCHARGE = (MAXIMUM PIPING DELIVERY RATE IN GALLONS PER MINUTE) x (5 minutes) Five minutes of pumping at the highest rate the supplying piping can actually deliver "oil" to the largest tank (which usually would have the largest supply piping and thus highest delivery rate if more than one size of piping supplies the facility).
RUPTURE:	DISCHARGE = ENTIRE CAPACITY OF LARGEST TANK The discharge rate could be high enough to lose the entire tank (or manifolded tank set) contents before the rupture is detected and action taken.
LEAKAGE:	DISCHARGE = ONE TENTH OF CAPACITY OF LARGEST TANK The discharge rate would typically be low enough to allow detection and action before more than 1/10 of the tank (or manifolded tank set) is lost.
FAULTY PIPING, ETC:	DISCHARGE = ONE TENTH OF CAPACITY OF LARGEST TANK The discharge rate would typically be low enough to allow detection and action before more than 1/10 of the tank (or manifolded tank set) is lost.

APPENDIX D
STI SP001-04

STANDARD FOR THE INSPECTION OF ABOVEGROUND STORAGE TANKS

SP001
ISSUED JULY 2006
4th EDITION

Steel Tank Institute
A Division of STI/SPFA
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Lake Zurich, IL 60047
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TABLE OF CONTENTS

PREFACE

The Steel Tank Institute (STI), formed in 1916, is a not-for-profit organization whose purpose is to secure co-operative action in advancing by all lawful means the common purposes of its members and to promote activities designed to enable the industry to conduct itself with the greatest economy and efficiency. It is further the purpose of STI to cooperate with other industries, organizations and government bodies in the development of reliable standards which advance industry manufacturing techniques to solve market-related problems.

This Standard was developed by the Steel Tank Institute AST Inspection Standard Committee comprised of the following members and alternates:

Chuck Travelstead, Chair
Brown-Minneapolis Tank
Innovative Tank Solutions
Albuquerque, NM

Bill Herdman, Co-Chair
Kennedy Tank & Manufacturing Co.
Indianapolis, IN

John Albert
Missouri Department of Agriculture
Weights and Measures Division
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Morrison Brothers Co.
Severna Park, MD

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Compensation Fund
Pierre, SD

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Anchorage, AK

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Staff Liaison, Steel Tank Institute
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1.0 GENERAL

1.1 This standard provides inspection and evaluation criteria required to determine the suitability for continued service of aboveground storage tanks until the next scheduled inspection. The purpose of conducting inspections is to identify the condition of and changes to the AST.

1.2 This Standard is intended for use by organizations and/or individuals who are knowledgeable and experienced in aboveground tank inspection. Note that the requirements included in this standard are minimum requirements and these other documents may have requirements that are more stringent. When applicable federal, state and local laws, and regulations concerning tank inspection are more stringent than the requirements of this standard, then these laws and regulations shall apply.

1.3 **OTHER STANDARDS**

1.3.1 Only aboveground tanks included in the scope of this standard are applicable for inspection per this standard.

1.3.2 Other standards, recommended practices and other equivalent engineering and best practices exist that provide alternative inspection requirements for tanks defined within the scope of this standard and for tanks outside the scope of this standard. For example, see API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction*, for additional information pertaining to tanks built to API Standard 650 and API Specification 12C tanks and API 12R1, *Recommended Practice for Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Production Service*, for tanks employed in production service or other similar service.

1.4 **OWNER'S RESPONSIBILITY**

1.4.1 The owner is responsible for compliance with fire codes, local ordinances, and other applicable rules and regulations. The owner may want to retain assistance from specialists to aid in regulatory compliance, safe operations and installations in accordance with recognized industry standards.

1.4.2 The owner shall verify that persons working on ASTs understand and address the hazards associated with the contents of the ASTs as well as safe entry and procedures associated with those ASTs.

1.4.3 The owner's inspector is responsible for performing the periodic AST inspections and documenting the results in accordance with this standard.

1.4.4 The owner has the responsibility to address corrective actions identified in inspection reports.

1.5 **SCOPE**

1.5.1 This standard applies to the inspection of aboveground storage tanks. These storage tanks include shop-fabricated tanks, field-erected tanks and portable containers as defined in this standard, as well as the containment systems. The requirements for field-erected tanks are covered separately in Appendix B.

1.5.2 This standard applies to ASTs storing stable, flammable and combustible liquids at atmospheric pressure with a specific gravity less than approximately 1.0.

1.5.3 This standard applies to ASTs storing liquids with operating temperatures between ambient temperature and 200 degrees F (93.3°C).

1.6 At a minimum, the following tank components shall be inspected (as applicable):

- Primary tank
- Secondary tank
- Tank supports
- Tank anchors
- Tank foundation and external supports
- Tank gauges and alarms
- Insulation covering
- Tank appurtenances
- Normal vents
- Emergency vents
- Release Prevention Barriers
- Spill Control Systems

2.0 DEFINITIONS

ABOVEGROUND STORAGE TANK (AST) – a tank or container designed to operate at pressures from atmospheric pressure through a gauge pressure of one psig measured at the top of the tank. The tank may be sitting on the ground, or set on supports, such as saddles, skids or legs, etc. and may be installed in a vault. Included are shop-fabricated tanks, field-erected tanks, and portable containers with a capacity of 55 U.S. gallons (208 liters) or greater.

CONTINUOUS RELEASE DETECTION METHOD (CRDM) – a means of detecting a release of liquid through inherent design. It is passive because it does not require sensors or power to operate. Liquid releases are visually detected by facility operators. The system shall be designed in accordance with good engineering practice. Several acceptable and commonly used CRDM systems are as follows:

- Release prevention barrier (RPB) described in definition of release prevention barrier.
- Secondary containment AST including double-wall AST or double-bottom AST
- Elevated AST with release prevention barrier described in definitions of elevated AST and release prevention barrier.

CORROSION RATE – the rate of degradation of materials due to chemical reactions with their environment. The rate of corrosion is established by the certified inspector as the maximum shell thickness loss divided by the operational service time.

CERTIFIED INSPECTOR – a tank inspector who meets the certification requirements identified in Section 4.2 of this standard.

DOUBLE-WALL AST – an AST with a primary tank contained within a secondary containment tank forming an interstitial (annular) space. An interstitial (annular) space between the two tanks is formed that is capable of being tested and monitored for leakage into the interstice

ELEVATED AST – an AST which is not in contact with the ground and which is raised above the surface of the ground or bottom of a vault using tanks supports. It allows for a visual external inspection of the bottom of the primary tank. Examples of elevated tanks are tanks constructed on grillage or grating, or tanks on supports.

FIELD-ERECTED AST – a welded carbon or stainless steel AST erected on-site where it will be used. For the purpose of this standard, ASTs meeting either of the following descriptions are to be inspected as field-erected ASTs:

a. An AST where the nameplate (or other identifying means such as accurate drawings) indicates that it is a field-erected AST. These are limited to a maximum shell height of 50 feet (15.24 meters) and a maximum diameter of 30 feet (9.14 meters).
b. An AST without a nameplate (or other identifying means such as accurate drawings) that is more than 50,000 U.S. gallons (189,271 liters) and a maximum shell height of 50 feet (15.24 meters) and a maximum diameter of 30 feet (9.14 meters).

FORMAL EXTERNAL INSPECTION (FEI) – a documented external inspection conducted by a certified inspector to assess the condition of the AST and determine its suitability for continued service without entry into the AST interior.

FORMAL INTERNAL INSPECTION (FII) - a documented internal inspection conducted by a certified inspector to assess the internal and external condition of the AST and determine its suitability for continued service. This includes the inspection requirements of a formal external inspection. A formal internal inspection satisfies the requirements of a formal external inspection and shall be considered equivalent to or better than a formal external inspection for the purposes of scheduling.

INSPECTION PLAN – a written plan developed by the owner or a Professional Engineer that details the inspection requirements for a facility.

INTERSTICE – in a double-wall AST, the space between the primary tank and secondary tank. In a double-bottom AST, the space or void between the two bottoms. This space may be open or closed to the atmosphere and may be monitored or tested by vacuum or leak detection equipment or by visual inspection.

LEAK TESTING METHOD (LTM) – a point in time test method to determine if an AST is liquid tight. Leak testing is not preventive in the sense that it provides an indication only if the AST integrity has already been breached. Therefore, it may be used as a tank integrity measure or as a supplement to other inspection procedures. LTMs may include the following technologies:

- Gas pressure decay (includes vacuum decay)
- Gas pressure soap bubble testing
- Gas tracers (e.g., helium tracer)
- Soil tracers (chemical marker)
- Mass measurement
- Level measurement
- Hydrostatic test

LOCKOUT/TAGOUT – a procedure for affixing lockout or tagout devices to energy isolating equipment and for otherwise disabling machines or equipment to prevent unexpected energization, startup, or release of stored energy. Its intent is to prevent injury to employees, and to comply with the following OSHA (Occupational Safety & Health Administration) regulations or their equivalent:

- 29 CFR part 1910.147, *The Control of Hazardous Energy (Lockout/Tagout)*
- 29 CFR part 1910.331 to 1910.333, *Electrical Lockout/Tagout.*

MAGNETIC FLUX LEAKAGE (MFL) – a method used to nondestructively inspect ferromagnetic materials such as a carbon steel floor plate. A magnetic field is applied to steel to near saturation, so that it cannot hold any additional field. In the presence of a flaw (wall thinning), some of the magnetic flux escapes or “leaks” into the surrounding environment, where magnetic sensors detect it and quantitatively report a flaw signal. Once the flaw is detected and identified, an ultrasonic thickness scan (UTS) is required in the area to quantify the flaw. This method is commonly used on AST floors (MFL Floorscan) to determine the underside condition of the tank floor.

MANWAY – an AST opening designed to allow personnel entry into an AST.

MICROBIAL INFLUENCED / INDUCED CORROSION (MIC) – corrosion accelerated/caused by certain microbes. Depending on the type of bacteria, the degree of microbial activity, and the thickness and type of AST material, MIC is characterized by a high rate of corrosion. It sometimes penetrates tank walls and bottoms in two years or less. It is typically characterized by a ring-like pattern of cone or crater-shaped penetrations.

NONDESTRUCTIVE EXAMINATION (NDE) – the development and application of technical methods to examine materials and/or components in ways that do not impair future usefulness and serviceability in order to detect, locate, measure, interpret, and evaluate flaws.

OWNER - the legal entity having control and responsibility for the operation of the existing AST and storage facilities.

OWNER’S INSPECTOR – the owner or owner’s designee responsible for conducting owner’s periodic AST inspections.

PAINT FAILURE – significant peeling, cracking, spalling, blistering, pitting and chipping etc. of the paint or coating on an AST resulting in the exposure of the metal surface and corrosion of the tank shell.

PERIODIC AST INSPECTION - a visual, documented inspection conducted by an owner's inspector, to assess the general AST conditions, as best as possible, without suspending AST operations or removing the AST from service.

PORTABLE CONTAINER - a closed AST having a liquid capacity equal to or greater than 55 U.S. gallons and not intended for fixed installation.

PRIMARY TANK – the tank in direct contact with the liquid stored.

PROFESSIONAL ENGINEER (PE) – a person who has fulfilled the education and/or experience requirements under state licensure laws and has received a license to practice engineering.

RELEASE PREVENTION BARRIER (RPB) – a liquid containment barrier that is sufficiently impervious to the liquid being stored and is installed under the AST. Its purpose is to divert leaks toward the perimeter of the AST where they can be easily detected as well as to prevent liquid from contaminating the environment. RPBs are composed of materials compatible with the liquid stored in the AST and meet proper engineering standards. Examples are steel (such as in steel double-bottom tanks), concrete, elastomeric liners, or other suitable materials provided the above criteria are met.

REMOTE IMPOUNDING - a spill control system that uses a sloped spillway to channel liquid releases away from an AST to a contained collection area that is remote from important facilities, adjoining property, or waterways. The containment area is sized for the capacity of the largest AST plus sufficient freeboard to allow for precipitation. For the purposes of this standard, remote impounding is equivalent to secondary containment. Remote impounding is further defined in NFPA 30.

SECONDARY CONTAINMENT SYSTEM - provides a secondary means of containment for the entire volumetric capacity of the largest single AST within a common dike/berm and sufficient freeboard to contain precipitation. The secondary containment system is to be designed to contain a spill until it can be discovered and cleaned up. It must be constructed to good engineering practices. (Note: See NFPA 30 and/or 40 CFR Part 112 and other local requirements for additional definitions.)

SECONDARY CONTAINMENT DIKE/BERM – a spill control system consisting of walls and a floor completely surrounding single/multiple ASTs. It provides a secondary means of containment for the entire capacity of the largest single AST and sufficient freeboard to contain precipitation and the displacement volume present below the dike wall of other ASTs in the containment area. The secondary containment dike/berm is to be constructed to good engineering practices.

SECONDARY CONTAINMENT AST – an AST with an integral secondary containment dike. These integral secondary containment dikes may be pans, boxes or containers and are designed to contain the contents of the primary tank if the primary tank fails. A secondary containment AST may be open or closed to the atmosphere. If precipitation cannot readily enter the integral secondary containment, then the containment need only be sized for the primary tank volume. If precipitation can enter the secondary containment, then the secondary containment is sized to contain the primary tank volume and with sufficient freeboard to contain precipitation.

SECONDARY TANK – the outer wall of a double-wall AST.

SHELL – for the purposes of this standard, the AST shell includes the roof, bottom, head or wall of the AST.

SHOP-FABRICATED – a welded carbon or stainless steel AST fabricated in a manufacturing facility or an AST not otherwise identified as field-erected with a volume less than or equal to 50,000 U.S. gallons (189,271 liters).

SINGLE-WALL AST – an AST with only one wall or shell.

SPILL CONTROL - a means of preventing a release of liquid to the environment including adjoining property and waterways. Methods include the following:

- Remote impounding
- Secondary containment dike/berm
- Secondary containment AST
- Secondary containment system

SUFFICIENTLY IMPERVIOUS - Sufficient resistance to diffusion and transport of hydrocarbon or other chemical substances to prevent contamination of the environment until clean-up occurs. Determination of "sufficiently impervious" is a technical consideration that a Professional Engineer or other qualified professional (such as Professional Geologist, Environmental Professional, etc.) must make. This determination is to be based on sound technical considerations, the site specific conditions, as well as risk based considerations, such that ground and groundwater contamination is prevented, using current normally accepted engineering practices and principles. Sufficiently impervious does not necessarily mandate the use of a liner. Additional information about liners is found in API 341, *A Survey of Diked-area Liner Use at Aboveground Storage Tank Facilities.*

SUITABILITY FOR CONTINUED SERVICE – the determination that an AST's condition is adequate for continued use based on the criteria presented in this standard.

TANK IN CONTACT WITH THE GROUND – an AST that does not include a release prevention barrier and has some part of its primary tank shell in direct contact with the ground or soil. Therefore, direct inspection of all exterior surfaces of the AST cannot be conducted from the tank exterior.

TANK SUPPORTS – structures designed to elevate an AST above the ground. These include saddles, skids, beams, legs, and similar structures.

ULTRASONIC TESTING SCAN (UTS) – an ultrasonic scan to evaluate the corrosion on the opposite side of the inspection surface using an ultrasonic flaw detector. This inspection is to be performed by an NDT examiner certified in accordance with ASNT-TC-1A (or equivalent) per paragraph 4.3.2.

ULTRASONIC THICKNESS TESTING (UTT) – a point thickness reading taken by a competent person, per paragraph 4.3.3, utilizing a digital ultrasonic thickness meter.

3.0 SAFETY CONSIDERATIONS

3.1 The hazards associated with the cleaning, entry, inspection, testing, maintenance or other aspects of ASTs are significant. Safety considerations and controls should be established prior to undertaking physical activities associated with ASTs.

3.2 This standard does not address all applicable health and safety risks and precautions with respect to particular materials, conditions or procedures. Information concerning safety and health risks and precautions should be obtained from the applicable standards, regulations, suppliers of materials and material safety data sheets.

3.3 The following activities may be regulated and consideration to the relevant requirements and best management practices shall be included in an inspection:

- Breaking Lines, Isolating, and Release of Equipment
- General Work Permit
- Hot Work
- Lockout/Tagout
- Gas Testing
- Contractor Safety
- Respiratory Protection
- Tank Cleaning, Repair, and Dismantling
- Confined Space Entry

3.4 Plans to enter an AST require development or use of appropriate safety procedures, precautions and requirements. The owner, the contractors and all persons associated with the AST inspection, cleaning or entry, shall review these prior to the start of work.

3.4.1 Before the inspection begins, check for the accumulation of harmful vapors around and in the AST. Refer to the following documents for additional information:

- NFPA 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning or Repair*
- API RP 2015, *Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks*
- API RP 2016, *Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks*

3.4.2 Each AST entry requires an Emergency Action Plan. The owner and contractor must develop the Plan together. This Plan describes the actions required for personal safety from fire and other emergencies. This plan includes the following requirements as well as others:

- SCBA (Self Contained Breathing Apparatus) and lifelines on site, as well as rescuers trained in their use.
- Establishment of and review of emergency escape routes and procedures with authorized entrants.
- Establishment of an assembly area and procedures to account for all authorized entrants after emergency evacuation is complete.
- Establishment of rescue and first-aid duties for those authorized entrants assigned to perform them.

3.4.3 After plans, procedures and administrative controls are in place and before entering the AST, isolate the AST by locking out and tagging all energy sources associated with the AST. Line isolation shall be at the closest flange practical to the equipment or space. Lockout/Tagout establishes a procedure for affixing lockout or tagout devices to energy-isolating equipment and for otherwise disabling machines or equipment to prevent unexpected energization, startup, or release of stored energy. Its intent is to prevent injury to employees, and to comply with the following OSHA regulations or their equivalent:

- 29 CFR part 1910.147, *The Control of Hazardous Energy (Lockout/Tagout*)
- 29 CFR part 1910.331 to 1910.333, *Electrical Lockout/Tagout*
- 29 CFR part 1910.146, *Permit-required Confined Spaces*

3.4.4 The atmosphere inside the space must be tested and confirmed safe before authorized entrants may enter without wearing supplied-air respiratory protection or SCBA. Continuous atmospheric monitoring is best. At a minimum, test the space for the following, and in the following order:

3.4.4.1 Oxygen

3.4.4.2 Flammable vapors

3.4.4.3 Toxics

3.5 Inspect the roof and support structures for soundness. Inspect stairs, ladders and platforms to determine that they can safely support equipment and people before accessing them. Corrosion may attack the deck plate at the edge of a fixed roof and at the rafters in the center of the roof first. Therefore, in addition to entry hazards, there are those associated with the access to AST roofs. For AST roofs where one side is not visible, it may be necessary to check the plate thickness with ultrasonic instrument or hammer test it to verify its adequacy. If there is a doubt, place planks on the roof that span structural members and walk on the planks instead of directly on the roof. These same hazards may also apply to other AST walking surfaces, such as the surfaces of floating roofs. Guidance for this is covered in API RP 2016, *Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks*.

3.6 A safety analysis shall be conducted prior to a leak test. Some leak testing scenarios may be hazardous. For example, the leak test methods referenced in 9.1.1 requires that either an inert gas be used or that the tank be thoroughly cleaned and gas free prior to testing and pressurizing an AST. Combining hydrocarbons with air provides a potentially hazardous atmosphere. Each test method may have unique hazards and these shall be considered and addressed in a pre-test safety plan prior to testing activities. A qualified person shall review the safety plan.

4.0 AST INSPECTOR QUALIFICATIONS

4.1 **OWNER'S INSPECTOR QUALIFICATIONS**

4.1.1 Periodic inspections are to be performed by an owner's inspector.

4.1.2 The personnel performing these inspections shall be knowledgeable of storage facility operations, the type of AST and its associated components, and characteristics of the liquid stored.

4.2 **CERTIFIED INSPECTOR QUALIFICATIONS**

4.2.1 Formal external and formal internal tank inspections are to be performed by a certified inspector.

4.2.2 A Certified inspector shall be certified by one or more of the following:

4.2.2.1 American Petroleum Institute (API) Standard 653 Authorized Inspector Certification with STI SP001 Adjunct Certification.

4.2.2.2 Steel Tank Institute (STI) Certified SP001 AST Tank System Inspector

4.2.2.3 Additional certifications as may be required by individual states or other governing bodies.

4.3 **NDT EXAMINER QUALIFICATIONS**

4.3.1 Non-destructive test (NDT) examiner - Personnel performing non-destructive examinations shall meet the qualifications described below, but need not be certified in accordance with paragraph 4.2. The results of NDE work, however, must be considered in the evaluation of the tank by the certified inspector.

4.3.2 Testing personnel referenced within this standard shall be qualified in accordance with their employer's written practice which must be in accordance with the American Society for Nondestructive Testing's (ASNT) document SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing" unless otherwise noted within this standard.

4.3.2.1 Referenced within this standard are the following nondestructive techniques. All inspectors performing the following inspection methods shall be certified per 4.3.2.

- MT – Magnetic Particle Testing
- RT – Radiographic Testing
- UT – Ultrasonic Testing
- MFL – Magnetic Flux Leakage
- PT – Penetrant Testing

4.3.3 Testing personnel performing ultrasonic thickness (UTT) point readings are required to have the minimum training described in this paragraph to operate a Digital Ultrasonic Thickness Meter. A Digital Ultrasonic Thickness Meter is an ultrasonic unit which is only used to obtain a point thickness reading displaying the resulting specimen thickness. This does not cover the use of ultrasonic flaw detectors. It does not cover the interpretation of an A, B or C scan unit readout.

4.3.3.1 Training - The operator of the digital ultrasonic thickness unit must be trained by a competent person in the operation, calibration and set-up of the unit. This should be a minimum of one hour and is usually performed by the manufacturer, or manufacturer's representative upon delivery of the unit. This training shall be documented and specifically state that the trainee has received at least one hour of training in the proper operation, calibration and set up of the unit. The unit type shall be noted on the documentation (manufacturer and model). The trainer shall sign his name to attest that the training has been completed and the trainee is now proficient in the use of that ultrasonic digital meter. At the time of training, the trainee shall have all of the tools and materials needed to carry out the proper function of the meter. These tools and materials are as follows:

- Step wedge of the right thickness range and material for the desired application.
- Ultrasonic couplant of the type that would be needed for the desired application.
- Ultrasonic transducer of the right type, frequency and diameter for the desired application.

4.3.3.2 Testing personnel should be aware that there are many factors that affect the performance and accuracy of a digital thickness meter, such as listed below:

- Equipment calibration
- Surface roughness of test specimen
- Coupling technique
- Couplant
- Curvature of test piece
- Taper or eccentricity of the test specimen
- Acoustic properties of the material to be tested
- Temperature of the test specimen

4.3.3.3 Surface coatings can have a significant effect on the performance and accuracy of the thickness reading. It is recommended that the surface coating be removed in test areas. There are digital thickness meters specifically made for the inspection of metal through coatings and these can be used without removal of the coating.

5.0 INSPECTION SCHEDULE

5.1 The owner shall use the AST's type, size, and type of installation, corrosion rate and previous inspection history, if any, to develop a schedule of applicable types of inspections for each AST per Table 5.5.

5.2 Owners who have an inspection plan shall use this standard to establish the inspection criteria for ASTs described in this standard using the AST type, size, and previous inspection history, type of installation and corrosion rate.

5.3 Certified inspectors using this standard to conduct inspections, shall use the AST type, size, previous inspection history, type of installation, corrosion rate and the schedule determined by the owner, so long as the information is correct and in accordance with the requirements of this standard.

5.4 **AST CATEGORIES USED IN TABLE 5.5**

5.4.1 Category 1 - ASTs with spill control, and with CRDM

5.4.2 Category 2 - ASTs with spill control and without CRDM

5.4.3 Category 3 - ASTs without spill control and without CRDM

5.4.4 Table 5.4 shows some typical tank types and their corresponding AST category

TABLE 5.4 EXAMPLE TANK CONFIGURATION AND AST CATEGORY

TANK CONFIGURATION	TANK HAS CRDM?	AST CATEGORY
AST in contact with ground	no	2 or 3
Elevated tank with spill control and with no part of AST in contact with ground	yes	1
Vertical tank with RPB and spill control	yes	1
Vertical tank with double bottom and spill control	yes	1
Vertical tank with RPB under tank and spill control	yes	1
Double-wall AST	yes	1
AST with secondary containment dike/berm	yes	1

5.5 **IN TABLE 5.5 USE THE FOLLOWING DESIGNATIONS:**

5.5.1 P – Periodic AST inspection
Refer to Section 6

5.5.2 E – Formal external inspection by certified inspector
Refer to Section 7

5.5.3 I – Formal internal inspection by certified inspector
Refer to Section 8

5.5.4 L – leak test by owner or owner's designee
Refer to Section 9

5.5.5 ( ) indicates maximum inspection interval in years. For example, E (5) indicates formal external inspection every 5 years.

TABLE 5.5 TABLE OF INSPECTION SCHEDULES

AST Type and Size (U.S. gallons)		Category 1	Category 2	Category 3
Shop-Fabricated ASTs	0 – 1100 (0-4164 liters)	P	P	P, E&L(10)
	1101 - 5,000 (4168-18,927 liters)	P	P, E&L(10)	[P, E&L(5), I(10)] or [P, L(2), E(5)]
	5,001 - 30,000 (18,931-113,562 liters)	P, E(20)	[P, E(10), I(20)] or [P, E(5), L(10)]	[P, E&L(5), I(10)] or [P, L(1), E(5)]
	30,001 - 50,000 (113,566-189,271 liters)	P, E(20)	P, E&L(5), I(15)	P, E&L(5), I(10)
Portable Containers		P	P	P**

** Owner shall either discontinue use of portable container for storage or have the portable container DOT (Department of Transportation) tested and recertified per the following schedule (refer to Section 9.0):
Plastic portable container - every 7 years
Steel portable container - every 12 years
Stainless Steel portable container - every 17 years

6.0 PERIODIC AST INSPECTIONS

6.1 Periodic AST inspections are to be conducted by owner's inspector. Checklists for periodic AST inspections are found in Appendix C of this standard. These are to be used as a guide for recording inspection data.

6.2 The owner's inspector must meet the requirements of paragraph 4.1.

6.3 Review prior inspection, repair and alteration data before each inspection. Note special conditions for a particular AST.

6.4 The owner's inspector is to complete the STI SP001 AST Record for each AST or tank site as designated in the checklists. Note special conditions and changes or alterations to the tank.

6.5 The owner's inspector is to complete the STI SP001 Monthly Inspection Checklist each month. Take note of instructions on the checklist. Note special conditions.

6.6 The owner's inspector is to complete the STI SP001 Annual Inspection Checklist each year. Take note of instructions on the checklist. Note special conditions.

6.7 For portable containers, the owner's inspector is to complete only the STI SP001 Portable Container Monthly Inspection Checklist each month. Take note of the instructions on the checklist. Note special conditions.

6.7.1 As an alternative, if documentation is kept on-site for each portable container that indicates how long each has been kept at the facility, then the owner's inspector is to complete only the STI

SP001 Portable Container Monthly Inspection Checklist each month for containers on-site for 91 days or more. Take note of the instructions on the checklist. Note special conditions.

6.8 Additional requirements for field-erected tanks are included in Appendix B.

6.9 Refer to Section 10.0 for conditions that warrant immediate action.

6.10 By removing water or taking other corrective action on a regular basis, harmful MIC is prevented. Monitor for water accumulation monthly. If corrosion is found due to MIC, treat the AST with a proper biocide or otherwise sterilize the AST. In addition, take necessary steps to repair or remove the AST from service, if warranted by the extent of the corrosion (per Section 10.0).

7.0 FORMAL EXTERNAL INSPECTION GUIDELINES

7.1 GENERAL

7.1.1 Formal external inspections are to be performed by certified inspectors per paragraph 4.2.

7.1.2 These guidelines are minimum inspection requirements. There are numerous AST configurations and components and it is the responsibility of the certified inspector to identify and properly inspect them to conform to the owner's requirements and/or industry standards. The inspector or the inspection company shall develop detailed checklists that identify, record and document all aspects of each inspection.

7.1.3 Review prior formal and periodic inspections, repair and alteration data before each inspection.

7.1.4 Record AST nameplate data, if available, and check the information included for accuracy against actual conditions. Record AST data, inspection findings, and problems identified.

7.1.5 Inspect the fabrication of the AST against applicable industry standards.

7.1.6 Inspect the AST foundations for indications of settlement, cracking, exposed rebar, or general disrepair. Inspect for areas of wash-out and voids under the AST. Confirm that the ground is sloped away from the AST and that there is no soil resting against the side of the AST covering parts of the shell or bottom extension. Inspect for standing water against the AST or the indication of drainage problems.

7.1.7 Visually inspect the AST support condition. Severe cracking or spalling of concrete supports shall be noted and evaluated. If there are pad plates between the supports and the shell, inspect the condition. Inspect the supports to be sure that they are sitting securely on the foundation or grade. If the supports are welded to the shell, inspect the welds for visible signs of stress or deterioration.

7.1.8 Identify and record the type of and the condition of the secondary containment, spill control, and CRDM, if present.

7.1.8.1 Visually inspect the general condition of the containment area to be sure that it is in good condition and that there is not a breach in the containment structure. Note changes from the original design and installation information if available.

7.1.8.2 Inspect for foreign materials in the containment area. Inspect for liquid in the containment system and CRDM. If liquid is present, find the source and report findings. Record other ASTs or containers within the same containment area.

7.1.8.3 Make sure that the drain valves are operable and in good condition. Report penetrations through the secondary containment that may compromise the integrity of the containment area. Report penetrations that are likely to lead to failure of the secondary containment should the liquid level of water or liquid rise to these penetrations.

7.1.9 Inspect and verify the operability of ancillary equipment including the following items:

7.1.9.1 Piping and piping connections for visible signs of stress or leakage such as severe corrosion, rusted bolted connections, or other severe degradation.

7.1.9.2 Normal and emergency vents and pressure/vacuum devices. Verify that the devices are of adequate size and capacity, operable, and in good condition. Refer to the device manufacturer's literature, typical industry venting requirements, and other appropriate resources. Record the types and locations of these devices.

7.1.9.3 Primary tank level gauge and secondary tank interstitial gauge for free movement and the floats, guides and attachments are in working order. Check that the liquid level gauge length is sized correctly for the tank diameter. Inspect the alarms connected to the level gauge for operability and for a complete loop and circuit from the primary sensor to the final annunciation or alarm point.

7.1.10 Inspect the bonding and grounding system of the AST, if present. (Refer to NFPA 780 *Standard for the Installation of Lightning Protection Systems.*)
7.1.11 Inspect stairways, handrails and platforms for broken welds, bent members, and corrosion.
7.1.12 Inspect the coating on the AST shell, heads, and supports for paint failure.
7.2 **DETERMINE THE ORIGINAL SHELL THICKNESS OF THE AST**. Suggested methods of determining this are as follows:
7.2.1 Review the original tank documentation, such as drawings and packing lists.
7.2.2 Consult the tank manufacturer.
7.2.3 Examine the tank labels for evidence of a widely accepted tank standard, such as Underwriters Laboratories Standard UL 142, etc. Consult the referenced standard to determine the minimum design shell thickness.
7.2.4 Measure the tank thickness of several areas of the tank that have no visible corrosion or pitting. The average of these measurements will result in a minimum shell thickness that can be used.
7.3 **HORIZONTAL AST**- Requirements in addition to the applicable items in 7.1
7.3.1 Inspect shell plates and welds for indications of exterior corrosion, buckling or distortion, as well as for cracking, pinholes or mechanical damage. Inspect the shell of the AST and the ancillary equipment for signs of distortion and stress.
7.3.1.1 Take and record UTT readings and the location of the reading of each plate or shell course in areas accessible without entering the AST. Readings must be concentrated in areas where corrosion is likely to occur. If significant internal corrosion is detected, further investigation using Ultrasonic Testing Scans (UTS) is required. If applicable, include areas marked from previous readings. Refer to Section 10.0.
7.3.2 Inspect shell attachments for changes made after the AST was fabricated. Refer to previous drawings or make new sketches that show all the appurtenances, attachments and nozzle locations on the AST shell and heads or roof. Record repads (reinforcing plates) and/or insert plates. Inspect attachment welds for signs of stress and corrosion.
7.4 **VERTICAL OR RECTANGULAR AST** - Requirements in addition to the applicable items in 7.1
7.4.1 Shell Surface – Refer to 7.3.1 and 7.3.2
7.4.2 Shell Attachments – Refer to 7.3.3
7.4.3 Vertical AST Roof - Inspect for low areas on the roof and standing water that may corrode the roof areas. Inspect for paint failure, holes and corrosion. Take UTT readings on the roof and record results. If possible, measure thicknesses in previously measured areas for corrosion rate determination. If significant corrosion is detected, further investigation using Ultrasonic Testing Scans (UTS) is required. Refer to Section 10.0
7.4.4 **DOUBLE WALL AND DOUBLE BOTTOM AST** - Requirements in addition to the applicable items in 7.1:
7.4.5 Verify that the leak detection equipment or method is operating if the tank is so equipped.
7.4.6 Check for a leak or the presence of liquid in the interstice.
7.4.7 Double-bottom ASTs require UTT readings of areas that are single-wall as described in paragraph 7.3.1.1 above. Double-wall ASTs do not require UTT readings.
7.5 **INSULATED AST** - Requirements in addition to the applicable items in 7.1 to 7.4
7.5.1 Remove the insulation in areas where mold or moisture is present or points where moisture is likely to accumulate and examine the metal surface for signs of signification corrosion. Consider the wicking effect of water in the insulation, particularly in the lower exterior portion of the tank shell.
7.5.2 If insulation damage is suspected, remove sections of the insulation to check for corrosion. Continue removing the insulation until the extent and nature of the corrosion has been established.
7.5.3 Take UTT readings of the shell and record results including, if applicable, areas marked from previous readings. If significant internal corrosion is detected, further investigation using Ultrasonic Testing Scans (UTS) is required. Refer to Section 10.0
7.6 Additional requirements for field-erected ASTs are included in Appendix B.
7.7 In the final report, include field data, measurements, pictures, drawings, tables and an inspection summary. In the summary, identify unacceptable conditions and recommended corrective actions. Determine the suitability for continued service of the AST per Section 10.0. Include the next

scheduled formal external inspection or formal internal inspection, as applicable. Include the inspector's name and certification number in the report.

8.0 FORMAL INTERNAL INSPECTION GUIDELINES

8.1 GENERAL

8.1.1 Formal internal inspections are to be performed by certified inspectors per paragraph 4.2.

8.1.2 These guidelines are minimum inspection requirements. There are numerous AST configurations and components and it is the responsibility of the certified inspector to identify and properly inspect them to conform to the owner's requirements and/or industry standards. The inspector or the inspection company shall develop detailed checklists that identify, record and document all aspects of each inspection.

8.1.3 A formal internal inspection includes the requirements of a formal external inspection with the addition of the requirements described below. Refer to paragraphs 7.1 to 7.7 for formal external inspection requirements.

8.1.4 Double wall tanks and secondary containment tanks may be inspected by checking the interstice for liquid or by other equivalent methods.

8.1.5 For elevated ASTs where all external surfaces of an AST are accessible, the internal inspection requirements may be satisfied with an examination from the exterior by using such methods as UTS. For all other situations, entry into the interior of the AST is necessary to assess the condition of all surfaces.

8.2 HORIZONTAL AST INTERNAL INSPECTION

8.2.1 Identify, measure, inspect and record all AST internal appurtenances. Inspect for mechanical damage, corrosion, cracking, etc. Inspect for deteriorating or corroding internal attachments and piping. Take thickness readings of internal structures and record the readings.

8.2.2 Inspect the welds for cracking by visual inspection or if necessary, by magnetic particle (MT) inspection or equivalent method.

8.2.3 Internal NDT Inspection

8.2.3.1 AST assessment:

8.2.3.1.1 Ultrasonic testing equipment that is capable of scanning the tank (UTS), rather than measuring only individual points (UTT), is the preferred method of testing. Personnel performing UTS are to be qualified per paragraph 4.3.2.

8.2.3.1.2 If ultrasonic testing equipment that is capable of scanning the tank (as described in 8.2.3.1.1) is not practical, use equipment that tests individual points. In this case, take UTT measurements of at least 15 points per each 12 inches x 12 inches (0.3 meters x 0.3 meters) square area of the shell that is in contact with the ground. Any questionable areas are to be assessed by UTS per 8.2.3.1.1.

8.2.3.2 Perform a vacuum box (VB) examination of questionable welds to check for leaks.

8.2.3.3 Refer to Section 10.0 for criteria for suitability for continued service.

8.3 VERTICAL AND RECTANGULAR AST INTERNAL INSPECTION

8.3.1 Identify record, inspect and measure all AST internals. Inspect AST internals to check for mechanical damage, corrosion, cracking, etc. Check for deteriorating or corroding internal attachments and piping. Take thickness readings of internal structures and record the readings.

8.3.2 Inspect the welds for cracking by visual inspection or if necessary, by magnetic particle (MT) inspection or equivalent method.

8.3.3 Internal NDT Inspection

8.3.3.1 AST floor thickness assessment is required as follows:

8.3.3.1.1 Complete coverage of the AST floor is recommended due to random corrosion characteristics of metal in contact with ground. Inspection of the AST floor is recommended using inspection methods capable of determining the underside floor condition such as UTS, MFL followed by UTS of questionable areas, or other equivalent methods.

8.3.3.1.2 If ultrasonic testing equipment that is capable of scanning the tank (as described in 8.3.3.1.1) is not practical, use equipment that tests individual points. In this case, take UTT measurements of at least 15 points per each 12 inches x 12 inches (0.3 meters x 0.3 meters) square area of the shell that is in contact with the ground. Any questionable areas are to be assessed by UTS per 8.3.3.1.1.

8.3.3.2 Perform a vacuum box (VB) examination of questionable welds to check for leaks.

8.3.4 Refer to Section 10.0 for criteria for Suitability for Continued Service.

8.4 Additional requirements for field-erected ASTs are included in Appendix B.

8.5 **REPORT** - In the final report, include field data, measurements, pictures, drawings, tables and an inspection summary. Identify in the summary unacceptable conditions and recommended corrective actions. Determine the suitability for continued service of the AST. Include the time until the next scheduled formal external and/or formal internal inspection, as applicable. Include the inspector's name and certification number in the report.

9.0 LEAK TESTING METHODS (LTM)

9.1 **SHOP-FABRICATED AST LEAK TESTING PROCEDURE**.

9.1.1 Consult the Steel Tank Institute Recommended Practice R912, *Installation Instructions for Shop Fabricated Stationary Aboveground Storage Tanks for Flammable, Combustible Liquids.* Air should not be used for a pressure test and an inert gas should be used instead. The introduction of a gas containing oxygen (such as air) to a tank that has previously held petroleum liquid can pose an explosion hazard.

9.1.2 Vacuum testing of the interstice of double-wall or double-bottom tanks is an option. Refer to the Steel Tank Institute Recommended Practice R912, *Installation Instructions for Shop Fabricated Stationary Aboveground Storage Tanks for Flammable, Combustible Liquids*.

9.2 **PORTABLE CONTAINERS LEAK TESTING PROCEDURE.** Refer to DOT Sections 49 CFR 173.28 (Reuse, reconditioning and remanufacturing of packagings - mainly for drums) and Part 178 - 49 CFR Subpart O - Testing of IBC's (section 178.803 Testing and certification of IBC's) and 49 CFR 180.605, or equivalent, for portable container testing and recertification.

9.2.1 See the definition of Leak Testing Methods for more information.

10.0 SUITABILITY FOR CONTINUED SERVICE

10.1 Evaluation for suitability for continued service is a result of formal internal and/or external inspections performed by a certified inspector. This section describes the recommended actions to be taken by the owner as a result of these inspections. These conditions and others found during these inspections may require additional inspections or evaluations.

10.2 **FORMAL EXTERNAL AND INTERNAL INSPECTIONS** (refer to AST categories in Section 5.0)

10.2.1 MIC – For all tanks in Table 5.5, if evidence of MIC is found at any time, then corrections and repairs should be promptly made to the AST. Refer to Steel Tank Institute SP031 *Standard for Repair of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids* for alterations or repairs to an AST. Conduct the next formal internal or formal external inspection no more than two years after the discovery of MIC.

10.2.1.1 When Table 5.5 allows formal external inspections to be performed in lieu of formal internal inspections, then conduct the next formal external inspection no more than two years after the discovery of MIC.

10.2.1.2 If the re-inspection shows that sufficient measures have been taken to eliminate MIC, such as regular and careful water removal and sterilization of the tank and piping systems, then the AST may be inspected according to Table 5.5.

10.2.2 Category 3 ASTs - If the shell thickness has been reduced to less than 75% of the original shell thickness, then the AST should be taken out of service and repaired or replaced. Refer to Steel Tank Institute SP031 *Standard for Repair of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids* for alterations or repairs to an AST. The certified inspector shall document in the report that the next formal external or formal internal inspection shall be within 5 years and each subsequent 5 years.

10.2.3 Category 2 ASTs – The AST shall be repaired or replaced if more than 3 square inches of any one square foot of the tank shell (i.e. approximately 2%) is found to be less than 75% of the original shell thickness or if the remaining shell thickness of an area is less than 50% of the original shell thickness at any point. Refer to Steel Tank Institute SP031 *Standard for Repair of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids* for alterations or repairs to an AST. The certified inspector shall document in the report that the next formal external or formal internal inspection shall be within 5 years and each subsequent 5 years.

10.2.4 Category 1 ASTs - The AST shall be repaired or replaced if more than 3 square inches of any one square foot of the tank shell (i.e. approximately 2%) is found to be less than 50% of the original shell thickness or if the remaining shell thickness of an area is less than 25% of the original shell thickness at any point. Refer to Steel Tank Institute SP031 *Standard for Repair of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids* for alterations or repairs to an AST. The certified inspector shall document in the report that the next formal external or formal internal inspection shall be within 5 years and each subsequent 5 years.

10.2.4.1 For Category 1 ASTs, alternatively, if the certified inspector establishes and documents a corrosion rate, the inspector may determine the next formal internal inspection based upon corrosion rates. The calculated time until the next formal internal inspection interval or the next formal external inspection, as applicable may exceed the values listed in Table 5.5 if corrosion rates allow.

10.2.4.2 Refer to API 575, *Inspection of Atmospheric and Low-Pressure Storage Tanks*, for some acceptable methods of determining corrosion rates.

10.2.4.3 Further, if the shell thickness is reduced anywhere to less than 25% of the original shell thickness, the AST should be repaired or replaced. Refer to Steel Tank Institute SP031 *Standard for Repair of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids* for alterations or repairs to an AST.

10.3 **OTHER TANK DAMAGE** – An AST subjected to damage caused by the following conditions requires evaluation by an engineer experienced in AST design or a tank manufacturer who will jointly with the owner determine if an immediate formal external or internal inspection is required:

- Fire - AST exposed to fire or flame impingement
- Natural disaster - AST exposed to flooding, hurricane force winds, etc. and has been lifted or damaged
- Excessive Settlement - AST that has experienced excessive settlement
- Overpressure - AST exposed to excessive internal pressure caused by overfill or failure of venting devices or other reason
- Damage from Cracking - AST with evidence of cracking of welds or of an AST surface

10.4 If a leak is discovered at any time by the owner or the inspector, the tank must be repaired, replaced or closed and removed from service in accordance with good engineering practice.

11.0 RECORDKEEPING

11.1 Retain each AST Record for the life of the AST.
11.2 Retain each Monthly Inspection Checklist for at least 36 months.
11.3 Retain each Annual Inspection Checklist for at least 36 months.
11.4 Retain each Portable Container Monthly Inspection Checklist for at least 36 months.
11.5 Retain all certified inspection reports for the life of the AST.

REFERENCES

American Petroleum Institute:

- API Standard 341, *A Survey of Diked-area Liner Use at Aboveground Storage Tank Facilities*
- API Standard 575, *Inspection of Atmospheric and Low Pressure Storage Tanks*
- API Standard 650, *Welded Steel Tanks for Oil Storage*
- API Recommended Bulletin D16, *Suggested Procedure for Development of a Spill Prevention Control and Countermeasure Plan*
- API 12R1, *Recommended Practice for Setting, Maintenance, Inspection, Operation and Repair of Tanks in Production Service*
- API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction*.
- API RP 2015, *Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks*
- API RP 2016, *Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks*

American Society for Nondestructive Testing

- ANSI/ASNT Recommended Practice No. ASNT-TC-1A, *Guideline to Personnel Qualification and Certification in NDT*

National Fire Protection Association:

- NFPA 30, *Flammable and Combustible Liquids*
- NFPA 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair*
- NFPA 780, *Standard for the Installation of Lightning Protection Systems*

Steel Tank Institute:

- SP031, *Standard for Repair of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids*
- STI-R893, *Recommended Practice For External Corrosion Protection of Shop Fabricated Aboveground Tank Floors*
- STI-R912, *Installation Instructions for Shop Fabricated Stationary Aboveground Storage Tanks for Flammable, Combustible Liquids*

Underwriters Laboratories Inc.

- UL 142, *Steel Aboveground Tanks for Flammable and Combustible Liquids*

United States Environmental Protection Agency:

- EPA 40 CFR part 112, *Oil Pollution Prevention and Response; Non-Transportation-Related Onshore and Offshore Facilities*
- EPA 510-K-95-002, *Musts for USTs.A Summary of Federal Regulations for Underground Storage Tank Systems*

United States Department of Labor, Occupational Safety & Health Administration (OSHA)

- 29 CFR Part 1910.147, *The Control of Hazardous Energy (Lockout/Tagout),*
- 29 CFR Part 1910.331 to 1910.333, *Electrical Lockout/Tagout*

United States Department of Transportation

- DOT Sections 49 CFR 173.28, *Reuse, Reconditioning and Remanufacturing of Packaging,*
- DOT part 178-49 CFR Subpart O, *Testing of IBC's*
- DOT 49 CFR part 178.803, *Testing and certification of IBC's*
- DOT 49 CFR part 180.605, *Portable container Testing and Recertification*

APPENDIX A
SUPPLEMENTAL TECHNICAL INFORMATION

1.0 TYPICAL AST DIAGRAMS

1.1 The diagram below shows terms commonly associated with ASTs. For the purposes of this standard, all of these surfaces are called the "shell" of the AST to avoid confusion.

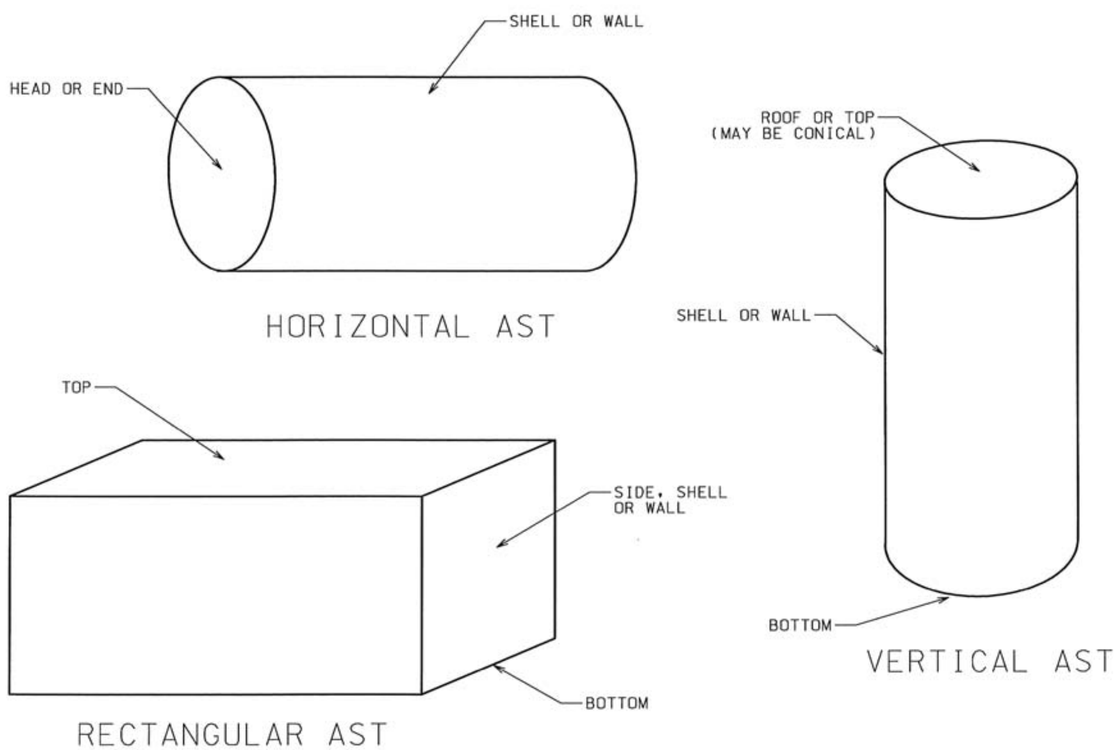

FIGURE A1.1

1.2 The diagram below is included to assist in the identification of the appurtenances of an AST. A specific tank may include some or all of these appurtenances.

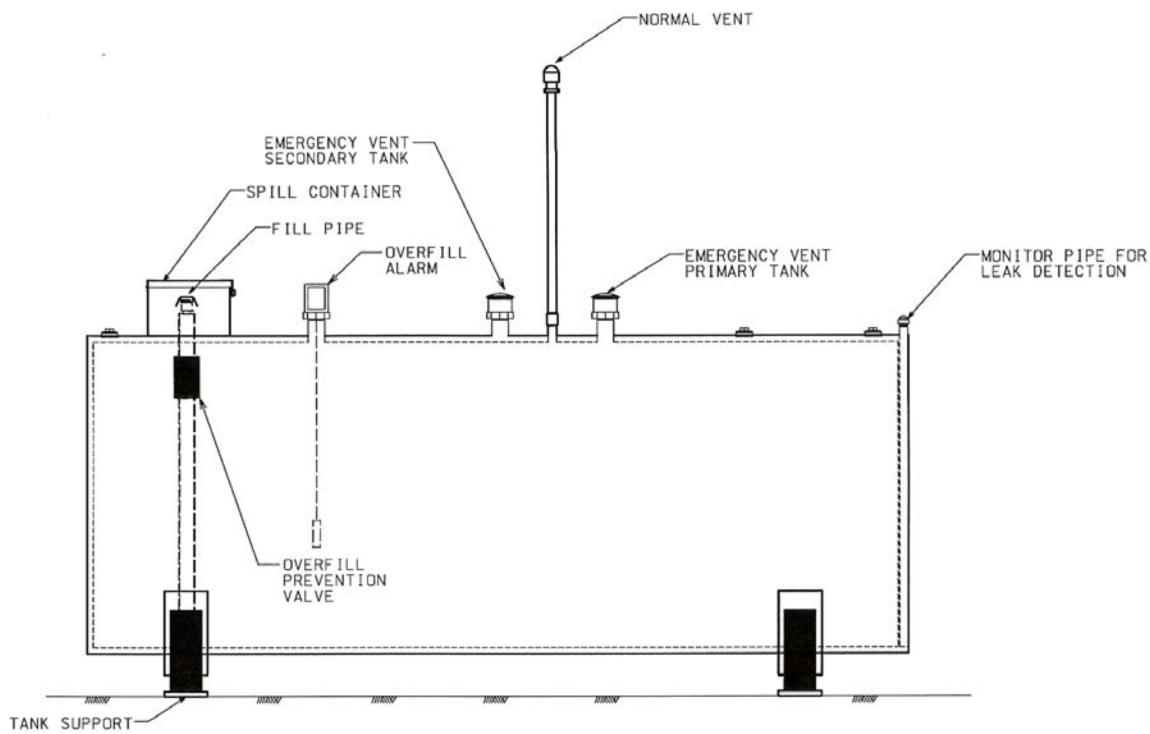

FIGURE A1.2

1.2.1 The purpose of these appurtenances is as follows:

1.2.1.1 Spill container – This tank accessory is designed to catch spills during tank filling operations. It typically has a lockable, hinged lid and allows spilled fluid to drain into the tank.

1.2.1.2 Tank vent – This tank accessory allows air to enter the tank when liquid is being withdrawn and exhausts air when the tank is being filled. This prevents damage to the tank due to too much pressure.

1.2.1.3 Overfill prevention valve – A specially designed device that provides positive shut-off at a predetermined value to prevent overfilling of an AST.

1.2.1.4 Overfill alarm – A device designed to alert personnel who are filling a tank when a predetermined level is reached.

1.2.1.5 Emergency vent (for primary and secondary tank)–These tank accessories prevent damage to the tank by allowing excess pressure to be vented. They are designed to relieve excess pressure in the event of an emergency, such as a fire.

1.2.1.6 Monitor pipe for leak detection –This pipe is installed in the air space (Interstice) between the primary tank and secondary tank of a double-wall tank. It is typically used with leak detection equipment to detect a leak in either the primary or the secondary tank.

1.2.1.7 Tank supports –These structures are used to elevate the tank off the ground.

2.0 WATER INSIDE ASTS

2.1 The functional life of an AST can be significantly extended by regularly checking for water accumulation inside an AST and interstice of a double-wall AST and removing it or taking other corrective action.

2.2 Water affects the quality of some stored liquids and therefore remove the water or take other corrective action on a regular basis.

2.3 Bacteria may develop in the water and in certain stored liquids, such as petroleum liquids, and initiate microbial activity. Microbial activity can cause the formation of undesirable by-products, such as sludge and slime. Such activity will corrode metals and deteriorate plastics and may affect product quality.

3.0 RELEASE MANAGEMENT SYSTEM (RMS)

3.1 One of the basic purposes of AST inspection standards is to minimize the likelihood and consequences of leaks. Even small leaks over extended periods may have considerable impacts on the environment. The use of industry standards to prevent leaks is a fundamental principle of pollution prevention. Industry standards cover the tank life cycle from construction, to ongoing inspection and maintenance, to final closure.

3.2 Applying RMS can reduce the likelihood and consequences of leaks. Typically, RMS is applied to provide additional integrity assurance against leaks.

3.3 In the context of this standard, RMS specifically refers to two basic methodologies as defined below:

- Leak Testing Methods (LTM)
- Continuous Release Detection Methods (CRDM)

3.4 Experience has shown long-term, slow leaks may develop and cause environmental damage with an AST that is in direct contact with the ground. These types of ASTs are subjected to the full hydrostatic pressure of the liquid on one side of the AST surface and are in direct contact with the ground on the other side of the AST surface. These ASTs may allow a slow leak over a long time with the full liquid hydrostatic pressure, which may go undetected and cause environmental damage. LTM is a layer of protection beyond conventional AST inspection practices that is most effective when applied to ASTs that are in direct contact with the soil and that do not have CRDMs. An LTM is ordinarily *not* necessary for tanks that have CRDMs (continuous release detection methods) such as elevated tanks, double-wall tanks, or tanks with release prevention barriers.

3.5 Figure A3.5 shows RMS graphically.

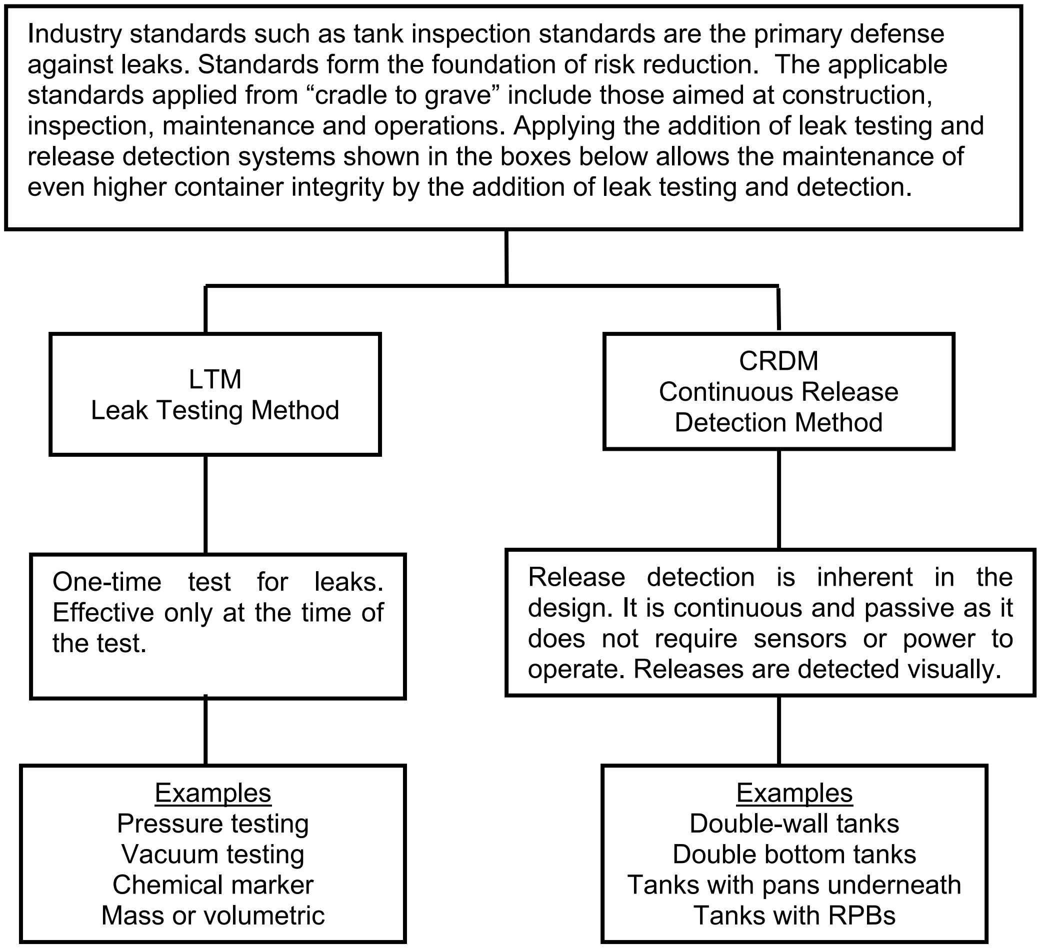

Figure A3.5
Release Detection Systems

4.0 REGULATIONS

4.1 The Federal EPA and some states have enacted regulations regarding the storage and handling of oils, both petroleum and non-petroleum, called the Spill Prevention Control and Countermeasures (SPCC) Rule under the authority of the Clean Water Act (40 CFR part 112). Entities regulated by these sections may use this standard or others to inspect and determine the fitness of their storage systems. Refer to http://www.epa.gov/oilspill/ for more information and The American Petroleum Institute's (API) Recommended Practice Bulletin D16, *Suggested Procedure for Development of a Spill Prevention Control and Countermeasure Plan,* (see: http://api-ep.api.org/)

APPENDIX B
INSPECTION OF FIELD-ERECTED ASTS

1.0 GENERAL

1.1 Purpose and Applicability – this Appendix addresses the additional and special inspection requirements of field-erected tanks. Tanks larger than 30 feet (9.1 meters) diameter or more than 50 feet (15.2 meters) high should be inspected according to an appropriate field-erected tank inspection standard. This Appendix is applicable only when specifically referenced by written contractual language between the owner and the inspector. Further, it is applicable only when not prohibited by the regulatory authority having jurisdiction. This appendix specifies only those requirements which modify or exceed the requirements of the main body of the standard.

1.2 Scope - This Appendix applies to steel ASTs that are as follows:

1.2.1 Welded and flat-bottom, cone-up or cone-down design

1.2.2 Up to 30 feet (9.1 meters) in diameter and with a height of less than 50 feet (15.2 meters).

1.2.3 Fabricated with full-fusion, butt-welded shells and with lap-welded or butt-welded bottom plates

1.2.4 Fabricated with a shell thickness of each course less than ½ inch and with original nominal bottom thickness plates equal to ¼ inch or 6 mm

1.2.5 Built to a nationally recognized standard.

1.3 Brittle Fracture Assessment - Because the tank shells are under ½ inch thick, the risk of brittle fracture is minimal. Brittle fracture assessments and documentation are not required for tanks that fall within the scope of this standard.

2.0 INSPECTIONS

2.1 Refer to the Table B2.1 below for the inspection timetable. Category 1, 2 and 3 as well as the P, E, I and L designations are described in the main body of the SP001 Standard. Note that the internal inspection intervals shown in this table are guiding values when corrosion rates are not determined in accordance with recognized and accepted industry principles and practice.

2.1.1 When corrosion rates are established, then the corrosion rates may govern the internal inspection interval which may be shorter or longer than the values shown.

2.1.2 For Category 1 tanks, the maximum internal re-inspection interval is 30 years.

2.1.3 For Category 2 tanks, the maximum internal re-inspection interval is 20 years.

2.1.4 For Category 3 tanks, the maximum internal re-inspection interval may not be longer than shown in Table B2.1.

TABLE B2.1 TABLE OF INSPECTION SCHEDULES

AST Type and Size	Category 1	Category 2	Category 3
Field-erected AST	P, E(5), I(10)	P, E&L(5), I(10)	P, E&L(5), I(10)

2.2 Follow the requirements found in the main body of the SP001 Standard for the requirements of periodic inspections, formal external inspections and formal internal inspections and any additional requirements in this Appendix. Also, follow all the requirements of the Safety Section. Leak testing methods for field-erected tanks currently under research by API and STI and requirements will be added to SP001 in the future.

2.3 Below are additional inspection requirements for field-erected ASTs

2.3.1 Vertical AST Floating Roof

2.3.1.1 For safety, make sure that the roof pontoons are free of liquid and harmful vapors and that the floating roof is properly stabilized against collapse. (see API 2016, *Guidelines and Procedures for*

Entering and Cleaning Petroleum Storage Tanks.) Inspect the vapor space on top of the floating roof before gaining access.

2.3.1.2 For formal internal inspections, inspect the seal for deterioration, holes, tears and cracks to determine the Suitability for Continued Service.

2.3.1.3 For external floating roofs, assess the condition of the outer roof rim plate by visual or ultrasonic methods. It may be necessary to assess the condition by performing ultrasonic inspection from the inside of the pontoon. Inspect that either the roof drain is open or the drain plug in the roof is open in case of unexpected rain. Inspect the roof legs for their contact with the floor and that the striker plates are present and in position. Inspect the roof legs for corrosion and damage.

2.3.1.4 Inspect for standing water on top of the roof and inspect the roof drainage system operation. Inspect the pontoons for presence of liquid.

2.4 Suitability for Continued Service

2.4.1 As an alternative to the criteria in the main body of SP001, and if the certified inspector is API 653 Certified, then the methods included in API 653 maybe used to evaluate the AST.

2.4.2 The minimum allowable remaining thickness is 0.1 inch (2.54 mm). In setting the next inspection interval based upon corrosion rates, neither the bottom nor the shell shall be allowed to corrode less than 0.1 inch.

2.4.2.1 The minimum required thickness of each shell course shall be according to

$$t_{\min} = \frac{(H-1)DG}{10{,}000}$$

t_{min} = the minimum acceptable average thickness, in inches, for each course as calculated from the above formula. However, t_{min} shall not be less than 0.1 inch (2.54 mm) for any tank course.

D = nominal diameter of tank, feet.

H = height from the bottom of the shell course under consideration to the maximum liquid level when evaluating an entire shell course, feet.

G = largest specific gravity of the contents.

2.4.3 One method of determining the interval between formal internal inspections required by the tank bottom assessment is as follows: (Corrosion rates shall be assumed constant for these calculations.)

$$MFIII = \frac{\min(RT_{bc}, RT_{ip}) - MRT}{(St\,\mathrm{Pr} + U\,\mathrm{Pr})}$$

MRT = minimum allowable remaining tank bottom thickness at the end of inspection interval which is 0.1 inch (2.54 mm).

MFIII = maximum formal internal inspection interval (years to next internal inspection) no to exceed that allowed in paragraph 2.1 of this Appendix.

RT_{bc} = minimum remaining thickness from bottom side corrosion after repairs.

RT_{ip} = minimum remaining thickness from internal corrosion after repairs.

St Pr = maximum rate of corrosion not repaired on the top side. This value is zero for coated areas of the bottom. The expected life of the coating must equal or exceed MFIII to use *St* Pr = 0.

U Pr = maximum rate of corrosion on the bottom side. To calculate the corrosion rate, use the minimum remaining thickness after repairs. For tanks that have proven cathodic protection, the corrosion rate from the underside shall be *U* Pr = 0.002 inches per year (0.05 mm per year).

Note: For areas of a bottom that have been scanned by the magnetic flux leakage (or exclusion) process, and do not have effective cathodic protection, the thickness used for calculating *U* Pr must be the lesser of the MFL threshold or the minimum thickness of corrosion areas that are not repaired. The MFL threshold is defined as the minimum remaining thickness to be detected in the areas inspected. This value should be predetermined by the owner based on the desired inspection interval.

2.4.4 Widely scattered pitting will not appreciably affect the strength of the tank shell and the tank may be allowed to continue operation provided that both of the following conditions are met:

2.4.4.1 Pit depths or thinning (with a diameter or maximum dimension of less than 2 inches (50.8 mm)) does not result in a remaining wall thickness of less than 0.05 inch (1.27 mm).

2.4.4.2 No pit or thinned area results in any area 2 inches (50.8 mm) in diameter or larger with a thickness less than 0.1 inch (2.54 mm).

APPENDIX C
PERIODIC INSPECTION CHECKLISTS

STI SP001 AST Record

OWNER INFORMATION	FACILITY INFORMATION	INSTALLER INFORMATION
Name	Name	Name
Number and Street	Number and Street	Number and Street
City, State, Zip Code	City, State, Zip Code	City, State, Zip Code

.

TANK ID ____________________________

SPECIFICATION:

Design: ☐ UL ___________ ☐ SWRI ___________ ☐ Horizontal ☐ Vertical ☐ Rectangular

☐ API ___________ ☐ Other ______________________

☐ Unknown

Manufacturer: Contents: Construction Date: Last Repair/Reconstruction Date:

Dimensions: Capacity: Last Change of Service Date:

Construction: ☐ Bare Steel ☐ Cathodically Protected (Check one: A. ☐ Galvanic or B. ☐ Impressed Current) Date Installed: _______________

☐ Coated Steel ☐ Concrete ☐ Plastic/Fiberglass ☐ Other

☐ Double Bottom ☐ Double Wall ☐ Lined Date Installed: _______________

Containment: ☐ Earthen Dike ☐ Steel Dike ☐ Concrete ☐ Synthetic Liner ☐ Other ____

CRDM: ☐ Date Installed: ________________ Type: ____

Release Prevention Barrier: ☐ Date Installed: ________________ Type: ____

TANK ID ____________________

SPECIFICATION:

Design: ☐ UL ________ ☐ SWRI ________ ☐ Horizontal ☐ Vertical ☐ Rectangular

☐ API ________ ☐ Other ______________

☐ Unknown

Manufacturer: Contents: Construction Date: Last Repair/Reconstruction Date:

Dimensions: Capacity: Last Change of Service Date:

Construction: ☐ Bare Steel ☐ Cathodically Protected (Check one: A. ☐ Galvanic or B. ☐ Impressed Current) Date Installed: __________

☐ Coated Steel ☐ Concrete ☐ Plastic/Fiberglass ☐ Other

☐ Double Bottom ☐ Double Wall ☐ Lined Date Installed: __________

Containment: ☐ Earthen Dike ☐ Steel Dike ☐ Concrete ☐ Synthetic Liner ☐ Other ______________________________

CRDM: ☐ Date Installed: Type:

Release Prevention Barrier: ☐ Date Installed: __________ Type: ______________________________

TANK ID ____________________

SPECIFICATION:

Design: ☐ UL ________ ☐ SWRI ________ ☐ Horizontal ☐ Vertical ☐ Rectangular

☐ API ________

☐ Unknown ☐ Other ______________

Manufacturer: Contents: Construction Date: Last Repair/Reconstruction Date:

Dimensions: Capacity: Last Change of Service Date:

Construction: ☐ Bare Steel ☐ Cathodically Protected (Check one: A. ☐ Galvanic or B. ☐ Impressed Current) Date Installed: __________

☐ Coated Steel ☐ Concrete ☐ Plastic/Fiberglass ☐ Other

☐ Double Bottom ☐ Double Wall ☐ Lined Date Installed: __________

Containment: ☐ Earthen Dike ☐ Steel Dike ☐ Concrete ☐ Synthetic Liner ☐ Other ______________________________

CRDM: ☐ Date Installed: Type:

Release Prevention Barrier: ☐ Date Installed: __________ Type: ______________________________

TANK ID ____________________________

SPECIFICATION:

Design: ☐ UL ___________ ☐ SWRI ___________ ☐ Horizontal ☐ Vertical ☐ Rectangular

☐ API ___________

☐ Unknown ☐ Other ____________________

Manufacturer: Contents: Construction Date: Last Repair/Reconstruction Date:

Dimensions: Capacity: Last Change of Service Date:

Construction: ☐ Bare Steel ☐ Cathodically Protected (Check one: A. ☐ Galvanic or B. ☐ Impressed Current) Date Installed: _______________

☐ Coated Steel ☐ Concrete ☐ Plastic/Fiberglass ☐ Other

☐ Double Bottom ☐ Double Wall ☐ Lined Date Installed: _______________

Containment: ☐ Earthen Dike ☐ Steel Dike ☐ Concrete ☐ Synthetic Liner ☐ Other ____

CRDM: ☐ Date Installed: Type:

Release Prevention Barrier: ☐ Date Installed: ________________ Type: ____

TANK ID ____________________________

SPECIFICATION:

Design: ☐ UL ___________ ☐ SWRI ___________ ☐ Horizontal ☐ Vertical ☐ Rectangular

☐ API ___________

☐ Unknown ☐ Other ____________________

Manufacturer: Contents: Construction Date: Last Repair/Reconstruction Date:

Dimensions: Capacity: Last Change of Service Date:

Construction: ☐ Bare Steel ☐ Cathodically Protected (Check one: A. ☐ Galvanic or B. ☐ Impressed Current) Date Installed: _______________

☐ Coated Steel ☐ Concrete ☐ Plastic/Fiberglass ☐ Other

☐ Double Bottom ☐ Double Wall ☐ Lined Date Installed: _______________

Containment: ☐ Earthen Dike ☐ Steel Dike ☐ Concrete ☐ Synthetic Liner ☐ Other ____

CRDM: ☐ Date Installed: Type:

Release Prevention Barrier: ☐ Date Installed: ________________ Type: ____

STI SP001 Monthly Inspection Checklist

General Inspection Information:

Inspection Date: ______________________ Retain Until Date: _________________________ (36 months from inspection date)

Prior Inspection Date: ______________________ Inspector Name: _______________________________________

Tanks Inspected (ID #'s): ____

Inspection Guidance:

- For equipment not included in this standard, follow the manufacturer recommended inspection/testing schedules and procedures.
- The periodic AST Inspection is intended for monitoring the external AST condition and its containment structure. This visual inspection does not require a certified inspector. It shall be performed by an owner's inspector who is familiar with the site and can identify changes and developing problems.
- Upon discovery of water in the primary tank, secondary containment area, interstice, or spill container, remove promptly or take other corrective action. Before discharge to the environment, inspect the liquid for regulated products or other contaminants and disposed of it properly.
- (*) designates an item in a non-conformance status. This indicates that action is required to address a problem.
- Non-conforming items important to tank or containment integrity require evaluation by an engineer experienced in AST design, a certified inspector, or a tank manufacturer who will determine the corrective action. Note the non-conformance and corresponding corrective action in the comment section.
- Retain the completed checklists for 36 months.
- **In the event of severe weather (snow, ice, wind storms) or maintenance (such as painting) that could affect the operation of critical components (normal and emergency vents, valves), an inspection of these components is required immediately following the event.**

Item	Status	Comments
1.0 Tank Containment		
1.1 Water in primary tank, secondary containment, interstice, or spill container?	☐Yes* ☐No	
1.2 Debris or fire hazard in containment?	☐Yes* ☐No	
1.3 Drain valves operable and in a closed position?	☐Yes ☐No*	
1.4 Containment egress pathways clear and gates/doors operable?	☐Yes ☐No*	

2.0 Leak Detection		
2.1 Visible signs of leakage around the tank, concrete pad, containment, ringwall or ground?	□Yes* □No	
3.0 Tank Attachments and Appurtances		
3.1 Ladder and platform structure secure with no sign of severe corrosion or damage?	□Yes □No*	
3.2 Tank Liquid level gauge readable and in good condition?	□Yes □No*	
3.3 Check all tank openings are properly sealed	□Yes □No*	
4.0 Other Conditions		
4.1 Are there other conditions that should be addressed for continued safe operation or that may affect the site SPCC plan?	□Yes* □No	

Additional Comments:

STI SP001 Annual Inspection Checklist

General Inspection Information:

Inspection Date: ____________________	Retain Until Date: ____________________ (36 months from inspection date)
Prior Inspection Date: ____________________	Inspector Name: ______________________________
Tanks Inspected (ID #'s): ______________________________	

Inspection Guidance:

- For equipment not included in this standard, follow the manufacturer recommended inspection/testing schedules and procedures.
- The periodic AST Inspection is intended for monitoring the external AST condition and its containment structure. This visual inspection does not require a certified inspector. It shall be performed by an owner's inspector who is familiar with the site and can identify changes and developing problems.
- Inspect the AST shell and associated piping, valves, and pumps including inspection of the coating for Paint Failure.
- Inspect:
  1. Earthen containment structures including examination for holes, washout, and cracking in addition to liner degradation and tank settling.
  2. Concrete containment structures and tank foundations/supports including examination for holes, washout, settling, paint failure, in addition to examination for corrosion and leakage.
  3. Steel containment structures and tank foundations/supports including examination for washout, settling, cracking, and for paint failure, in addition to examination for corrosion and leakage.
- Inspection of cathodic protection system, if applicable, includes the wire connections for galvanic systems and visual inspection of the operational components (power switch, meters, and alarms) of impressed current systems.
- Remove promptly upon discovery standing water or liquid in the primary tank, secondary containment area, interstice, or spill container. Before discharge to the environment, inspect the liquid for regulated products or other contaminants and disposed of it properly.
- In order to comply with EPA SPCC (Spill Prevention, Control and Countermeasure) rules, a facility must regularly test liquid level sensing devices to ensure proper operation (40 CFR 112.8(c)(8)(v)).
- (*) designates an item in a non-conformance status. This indicates that action is required to address a problem.
- Non-conforming items <u>important to tank or containment integrity</u> require evaluation by an engineer experienced in AST design, a certified inspector, or a tank manufacturer who will determine the corrective action. Note the non-conformance and corresponding corrective action in the comment section.
- Retain the completed checklists for 36 months.
- Complete this checklist on an annual basis supplemental to the owner monthly-performed inspection checklists.
- **Note: If a change has occurred to the tank system or containment that may affect the SPCC plan, the condition should be evaluated against the current plan requirement by a Professional Engineer knowledgeable in SPCC development and implementation.**

Item	Status	Comments
1.0 Tank Containment		
1.1 Containment structure in satisfactory condition?	☐Yes ☐No*	
1.2 Drainage pipes/valves fit for continued service	☐Yes ☐No* ☐ N/A	
2.0 Tank Foundation and Supports		
2.1 Evidence of tank settlement or foundation washout?	☐Yes* ☐No	
2.2 Cracking or spalling of concrete pad or ring wall?	☐Yes* ☐No	
2.3 Tank supports in satisfactory condition?	☐Yes ☐No*	
2.4 Water able to drain away from tank?	☐Yes ☐No*	
2.5 Grounding strap secured and in good condition?	☐Yes ☐No*	
3.0 Cathodic Protection		
3.1 CP system functional?	☐Yes ☐No* ☐n/a	
3.2 Rectifier Reading:		
4.0 Tank External Coating		
4.1 Evidence of paint failure?	☐Yes* ☐No	
5.0 Tank Shell/Heads		
5.1 Noticeable shell/head distortions, buckling, denting or bulging?	☐Yes* ☐No	
5.2 Evidence of shell/head corrosion or cracking?	☐Yes* ☐No	
6.0 Tank Manways, Piping and Equipment within Secondary Containment		
6.1 Flanged connection bolts tight and fully engaged with no sign of wear or corrosion?	☐Yes ☐No*	
7.0 Tank Roof		
7.1 Standing water on roof?	☐Yes* ☐No	
7.2 Evidence of coating cracking, crazing, peeling, blistering?	☐Yes* ☐No	
7.3 Holes in roof?	☐Yes* ☐No	

Item	Status		Comments
8.0 Venting			
8.1 Vents free of obstructions?	☐Yes	☐No*	
8.2 Emergency vent operable? Lift as required?	☐Yes	☐No*	
9.0 Insulated Tanks			
9.1 Insulation missing?	☐Yes*	☐No	
9.2 Are there noticable areas of moisture on the insulation?	☐Yes*	☐No	
9.3 Mold on insulation?	☐Yes*	☐No	
9.4 Insulation exhibiting damage?	☐Yes*	☐No	
9.5 Is the insulation sufficiently protected from water intrusion?	☐Yes	☐No*	
10.0 Level and Overfill Prevention Instrumentation of Shop-Fabricated Tanks			
10.1 Has the tank liquid level sensing device been tested to ensure proper operation?	☐Yes	☐No*	
10.2 Does the tank liquid level sensing device operate as required?	☐Yes	☐No*	
10.3 Are overfill prevention devices in proper working condition?	☐Yes ☐N/A	☐No*	
11.0 Electrical Equipment			
11.1 Are tank grounding lines in good condition?	☐Yes ☐N/A	☐No*	
11.2 Is electrical wiring for control boxes/lights in good condition?	☐Yes ☐N/A	☐No*	

Additional Comments:

STI SP001 Portable Container Monthly Inspection Checklist

General Inspection Information:

Inspection Date: ______________	Retain Until Date: ______________	(36 months from inspection date)
Prior Inspection Date: ______________	Inspector Name: ______________________	
Containers Inspected (ID #'s): ______________________________		

Inspection Guidance:

- For equipment not included in this standard, follow the manufacturer recommended inspection/testing schedules and procedures.
- The periodic AST Inspection is intended for monitoring the external AST condition and its containment structure. This visual inspection does not require a certified inspector. It shall be performed by an owner's inspector who is familiar with the site and can identify changes and developing problems.
- (*) designates an item in a non-conformance status. This indicates that action is required to address a problem.
- Non-conforming items important to tank or containment integrity require evaluation by an engineer experienced in AST design, a certified inspector, or a tank manufacturer who will determine the corrective action. Note the non-conformance and corresponding corrective action in the comment section.
- Retain the completed checklists for 36 months.

Item	Area: ______________	Area: ______________	Area: ______________	Area: ______________
1.0 AST Containment/Storage Area				
1.1 ASTs within designated storage area?	☐Yes ☐No*	☐Yes ☐No*	☐Yes ☐No*	☐Yes ☐No*
1.2 Debris, spills, or other fire hazards in containment or storage area?	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No
1.3 Water in outdoor secondary containment?	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No
1.4 Drain valves operable and in a closed position?	☐Yes ☐No*	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No
1.5 Egress pathways clear and gates/doors operable?	☐Yes ☐No*	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No

Item	Area: ________________	Area: ________________	Area: ________________	Area: ________________
2.0 Leak Detection				
2.1 Visible signs of leakage around the container or storage area?	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No
3.0 Container				
3.0 Noticeable container distortions, buckling, denting or bulging?	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No

Comments:

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APPENDIX E
EPA MEMORANDUM OSWER 9360.8-38

OSWER 9360.8-38

MEMORANDUM

SUBJECT: Use of Alternative Secondary Containment Measures at Facilities Regulated under the Oil Pollution Prevention Regulation (40 CFR Part 112)

FROM: Marianne Lamont Horinko
Assistant Administrator

TO: Oil National Policy Managers, Regions 1-10

PURPOSE

This memorandum amends the guidance issued on April 29, 1992 (i.e., Use of Alternative Secondary Containment Measures at Facilities Regulated under the Oil Pollution Regulation (40 CFR Part 112), (OSWER 9360.8-37) concerning the potential use of certain double-wall aboveground storage tanks (ASTs) for secondary containment purposes. A copy is attached for your reference. This guidance also clarifies when shop-built double-walled ASTs satisfy the applicable secondary containment requirements in the Spill Prevention, Control, and Countermeasure (SPCC) rule, found at 40 CFR part 112. We take this step because larger shop-built ASTs that use the protective measures described in the 1992 guidance are generally protective of the environment under certain circumstances.

BACKGROUND

On April 29, 1992, EPA issued guidance on how certain shop-built double-wall ASTs may comply with the secondary containment requirements of §112.7(c). The guidance discussed compliance with §112.7(c) only, and did not discuss compliance with other applicable SPCC provisions. We said at the time that “there should be many situations in which protection of navigable waters substantially equivalent to that provided by the secondary containment systems listed in section 112.7(c) could be provided by alternative AST systems that have capacities generally less than 12,000 gallons and are installed and operated with protective measures other than secondary containment dikes.”

DISCUSSION

SPCC secondary containment requirements. Section 112.7(c) requires that the owner or operator:

“Provide appropriate containment and/or diversionary structures or equipment to prevent a discharge as described in §112.1(b). The entire containment system, including walls and floor, must be capable of containing oil and must be constructed so that any discharge from a primary containment system, such as a tank or pipe, will not escape the containment system before cleanup occurs. At a minimum, you must use one of the following preventive systems or its equivalent:

(1) For onshore facilities:
(i) Dikes, berms or retaining walls sufficiently impervious to contain oil;
(ii) Curbing;
(iii) Culverting, gutters or other drainage systems;
(iv) Weirs, booms or other barriers;
(v) Spill diversion ponds;
(vi) Retention ponds; or
(vii) Sorbent materials.
(2) For offshore facilities:
(i) Curbing, drip pans; or
(ii) Sumps and collection systems."

After nearly a decade of evaluation of the construction, performance, and use of certain shop-built double-wall ASTs, we believe that they may serve as an "equivalent" preventive system for purposes of §112.7(c).

In 1992, we recognized that a shop-built double-wall AST with a capacity "generally less than 12,000 gallons" that was installed and operated with protective measures other than a secondary containment dike might meet the secondary containment requirements of §112.7(c). We described those protective measures as "when the inner tank is an Underwriters' Laboratory-listed steel tank, the outer wall is constructed in accordance with nationally accepted industry standards (e.g., those codified by the American Petroleum Institute, the Steel Tank Institute, and the American Concrete Institute), the tank has overfill prevention measures that include an overfill alarm and an automatic flow restrictor or flow-shutoff, and all product transfers are constantly monitored."

Today, after nearly a decade of experience in which we have seen the construction, performance, and use of shop-built double-wall ASTs, we note a low occurrence of discharges from such tanks, including tanks with a capacity of 12,000 gallons or more. In some cases, such tanks provide secondary containment where none existed before, or superior environmental protection to alternative containment systems previously used. We believe that a 12,000 gallon limitation on the use of certain shop-built double-wall ASTs is therefore no longer necessary, and believe that shop-built double-wall ASTs that use the protective measures described in 1992 generally satisfy the secondary containment requirements found in §112.7(c).

Bulk storage secondary containment requirements (§112.8(c)(2)); inspection requirements (§112.8(c)(6)). For the same reasons outlined above, we also believe that shop-fabricated double-wall AST, regardless of size, may generally satisfy not only the secondary containment requirements of §112.7(c), but also the bulk storage secondary containment requirements found at §112.8(c)(2). Section 112.8(c)(6) requires the owner or operator to conduct integrity testing on a regular schedule and whenever he makes repairs. The owner or operator must also frequently inspect the outside of the container for signs of deterioration, discharges, or accumulation of oil inside diked areas. To comply with the requirement to frequently inspect the outside of the tank, an owner or operator must inspect the inner wall and interstitial spaces of a shop-built double-wall AST. We recommend the use of automatic detection devices to detect discharges into the interstitial space. Owners or operators should conduct this integrity testing and inspection in accordance with industry standards, when practicable. One industry standard presently available is “SP001-00, Standard for Inspection of In-Service Shop-Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids.” Other applicable standards may be developed in the future.

Other applicable SPCC requirements. While shop-fabricated double-wall ASTs may satisfy the requirements of §112.7(c) and §112.8(c)(2), such tanks must also continue to satisfy all other applicable SPCC requirements. For example, the facility owner or operator must satisfy §112.7(h) requirements for tank car and tank truck loading/unloading racks if he transfers oil in bulk to those tanks from highway vehicles or railroad cars. If such transfers occur, where loading/unloading area drainage does not flow into a catchment basin or treatment facility designed to handle spills, a quick drainage system must be used. The containment system must be designed to hold at least the maximum capacity of any single compartment of a tank car of tank truck loaded or unloaded at the facility.

Additionally, any piping, equipment, or device not contained within a double-wall AST is subject to the requirements of §112.8(b)(3) and (4), if such piping, equipment, or device is in an undiked area.

CONCLUSION/IMPLEMENTATION Should you have any questions concerning this memorandum, please contact Hugo Fleischman, of my staff, at 703-603-8769.

OSWER 9360.8-38

Attachment

cc: Michael B. Cook
Elaine Davies
Andrew Gordon
David Drelich
Oil Removal Managers
OERR Records Manager, IMC 5202G
OERR Documents Coordinator, HOSC 5202G
Jeff Josephson, Superfund Lead Region Coordinator, USEPA Region 2
NARPM Co-Chairs
Doug Kodama, Oil Lead Region Coordinator, USEPA Region 2

APPENDIX F
PST INSPECTION CHECKLISTS

CHECKLIST 1 - DIKE DRAINAGE (SECONDARY CONTAINMENT) INSPECTION

Inspector Name/Phone Number: ____________________________

Tank Number: ____________________________________

Responsible Activity: ______________________________________

Inspection Items												
Year:												
Date:												
Initials:												
Inspect the secondary containment structure to ensure it is free of debris and capable of containing a release from the single largest container located within containment structure.*												
All POL and/or hazardous substances spills inside and outside of containment should be cleaned up immediately. All spills should be reported to appropriate personnel. Corrective actions for spills will usually involve the use of a variety of absorbent materials. Dispose in accordance with SPCC Plan provisions.*												
Prior to unlocking and opening the drain valve, visually inspect the containment area to make certain there is no oil sheen, evidence of a release, or noticeable odors from the accumulated rainwater.*												
If evidence of a release is observed, the contents of the containment cannot be discharged directly to the ground surface. Coordinate with appropriate personnel or chain of command to have contaminated water emptied into 55-gallon drums or other appropriate sized containers for proper disposal. Coordination through Environmental and Natural Resources Management Office may be necessary.*												
If no evidence of POL or hazardous materials are observed within the containment, and no visible oil sheen is noticeable, open the drain valve and drain all clean water to ground surface. Or, alternatively, if the volume of rainwater is negligible, and dry hot weather is forecast, allowing the rainwater to evaporate is authorized.*												
Close the drain valve completely and lock it after the inspection.*												
Inspect the facility after each rain event and at least quarterly.*												

NOTES:

* Inspection protocol taken from Draft Stormwater Pollution Prevention Plan for US Army Signal Center & Fort Gordon; Augusta, Georgia dated October 5, 2007

CHECKLIST 2 - BULK PST DAILY INSPECTION

Inspector Name/Phone Number: ______________________________
Tank Number: _______________________________________
Responsible Activity: ____

Inspection Items								
	Year:							
	Month:							
	Day:	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Sun**
	Date:							
	Initials:							
Tank & Piping structural integrity.								
Drainage valves closed.								
Condition of valves.								
Water/trash in containment.								
Evidence of spills.								
Cracks in containment.								
Cathodic Protection System functioning properly.								
Condition coating on Tank & Piping.								
Tank marking legible.								
HLA/liquid level gauge working.								
Tank/Piping support and foundation.								
Spill control systems (OWS).								
Maintenance actions:								
Date of request:								
Date work completed:								

NOTES:

CHECKLIST 3 - UST MONTHLY INSPECTION

Inspector Name/Phone Number: ______________________________

Tank Number: _______________________________________

Responsible Activity: ____

Inspection Items													
	Year:												
	Month:	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
	Date:												
	Initials:												
Is leak detection system working?													
Monthly leak detection report.													
Oil/water in pipe sump.													
Is overfill alarm working.													
Water in tank.													
Evidence of surface spills.													
Problems with pumps.													
Is dispenser piping leaking?													
Is Cathodic protection functioning properly?													
Is liquid level gauge functioning properly?													
Are tank markings legible?													
Is the Fuel Master system working?													
Maintenance actions:													
Date of request:													
Date work completed:													

NOTES:

CHECKLIST 4 - AST MONTHLY INSPECTION

Inspector Name/Phone Number: ______________________________

Tank Number: _______________________________________

Responsible Activity: ____

Inspection Items												
Year:												
Month:	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
Date:												
Initials:												
Tank & Piping structural integrity?												
Drainage valves closed?												
Condition of valves?												
Water/trash in containment?												
Evidence of spills?												
Cracks in containment?												
Cathodic Protection System status?												
Condition of coating on Tank & Piping?												
Tank marking legible?												
HLA/liquid level gauge/FM working?												
Tank/Piping support and foundation?												
Spill control systems (OWS)?												
If present, is dispenser leaking?												
Maintenance actions:												
Date of request:												
Date work completed:												

NOTES:

CHECKLIST 5 - OFFLOADING/LOADING AREA INSPECTION

Inspector Name/Phone Number: ______________________________

Loading/Offloading Area: _______________________________________

Responsible Activity: ____

Inspection Items								
	Year:							
	Day/Month:							
	Date:							
	Initials:							
Is Overfill Prevention System functioning?								
During transfer operations, drip pans or other protective devices will be used to catch incidental spills or drips from hose nozzles, hose racks, drums or barrels. Spill equipment such as absorbent pads, rags or mops should be readily available in the event of a spill*								
Connections, valves, pipes, hoses and soil chutes carrying oil shall be tightly connected and leak-free. Connections shall be routinely inspected and inspected and replaced or repaired immediately.*								
Condition of containment area?								
Water in containment?								
Drain valves locked?								
Any PM required?								
Maintenance actions:								
Date of request:								
Date work completed:								

NOTES:

* Inspection protocol taken from Draft Stormwater Pollution Prevention Plan for US Army Signal Center & Fort Gordon; Augusta, Georgia dated October 5, 2007

CHECKLIST 6 - TANK TRUCK DAILY INSPECTION

Inspector Name/Phone Number: ____________________________

Truck: ____________________________________

Responsible Activity: ______________________________________

Inspection Items	Year:							
	Day	**Mon**	**Tue**	**Wed**	**Thur**	**Fri**	**Sat**	**Sun**
	Date:							
	Initials:							
Is Overfill Prevention System functioning?								
Condition of Tank Compartments?								
Condition of Valves system?								
Breaks Functioning?								
Fire Extinguisher on board?								
Lights, horn & signals working?								
Any PM required?								
Maintenance actions:								
Date of request:								
Date work completed:								

NOTES:

CHECKLIST 7 - CATHODIC PROTECTION QUARTERLY INSPECTION

Inspector Name/Phone Number: ________________________

Tank Number: ______________________________________

Responsible Activity: _________________________________

Inspection Items					
	Year:				
	Quarter:	**1**	**2**	**3**	**4**
	Date:				
	Initials:				
Is CP System functioning?					
What does the rectifier read?					
What do the Test Points read? (add additional notes as needed)					
Condition of overall system ok?					
Water in rectifier?					
All leads appear intact?					
Any PM required?					
Maintenance actions:					
Date of request:					
Date work completed:					

NOTES:

CHECKLIST 8 - OIL FILLED EQUIPMENT & GENERATOR MONTHLY INSPECTION

Inspector Name/Phone Number: ____________________________

Tank Number: ____________________________________

Responsible Activity: ______________________________________

Inspection Items													
	Year:												
	Month:	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
	Date:												
	Initials:												
Evidence of spills?													
Fuel Tank Shows Corrosion?													
Maintenance actions:													
Date of request:													
Date work completed:													

NOTES:

PROCEDURES FOR DRAINING SECONDARY CONTAINMENT DIKES

The secondary containment of all ASTs must be impervious to the product being stored and, therefore, it will also retain stormwater. The accumulation of this water reduces the available capacity of the dike to contain a possible release from the tank and also creates a hazardous condition around the tank for operations and for proper maintenance. For these reasons the dikes must be drained periodically.

Because of the possibility of oil being present within the secondary containment area, no stormwater shall be released until it is carefully inspected and, if necessary, all oil is removed with a skimmer, absorbent pads or absorbent booms.

A drainage event shall be performed **only** under the supervision of the person responsible for spill prevention at a facility and follow the following steps:

1. When standing water is observed within the diked area, an approximation of the volume shall first be made and recorded.

2. Determine if there is a layer or sheen of oil on the water surface.

3. If oil is present, completely remove with a skimmer, absorbent pads or an absorbent boom.

4. After it is determined that no oil is present, or after all oil is removed, the drain valve shall be unlocked and opened. This operation shall be manned at all times to handle the possibility of a release of oil during the drainage event.

5. When the drainage event has been completed, the person responsible for spill prevention shall assure that the drain valve is closed and locked.

6. A log of each drainage event shall be kept which records the following:

    * Date
    * Conditions found
    * Oil removed, if any
    * Approximate volume of water released
    * Initials of person responsible

(Note: See following page for sample dike drainage record.)

PROCEDURES FOR OIL DELIVERIES TO PSTs

The procedures listed below shall be followed by personnel when making oil deliveries to PSTs:

1. Turn off truck ignition and set brakes.
2. Gauge tank and determine how many gallons can safely be transferred into it without overfilling.
3. Make transfer, attending the hose nozzle at all times.
4. Visually inspect the tank, valves, fittings and piping for leaks or possible causes of leaks.
5. Contact the Environmental Department if any signs of leaks observed.
7. Record the tank number, the amount delivered and the date in the driver’s log. (Complete any other paperwork required by the receiving facility.)
8. Secure the tank fill port.
9. Store hose and, before leaving the tank site, cleanup any spills or drips that may have occurred.

APPENDIX G
SPILL HISTORY

NAPR SPILL HISTORY						
Incident Date/Time	**Type of Incident**	**Incident Cause**	**Location**	**Medium Affected**	**Material Name**	**Description Of Incident**
9/16/2008 10:30	VESSEL	EQUIPMENT FAILURE	PELICAN'S ROOST MARINA	WATER	OIL: DIESEL	THE SUSPECTED RESPONSIBLE PARTY'S PLEASURE CRAFT IS LEAKING DIESEL INTO THE WATER. THE FUEL TANK IS LEAKING INTO THE BILGE AND THE BILGE PUMP IS PUMPING THE FUEL OVERBOARD.
5/7/2001 9:30	STORAGE TANK	OTHER	NAVAL STATION	LAND	JET FUEL: JP-5 (KEROSENE, HEAVY)	THE MATERIAL RELEASED OUT OF THE JP5 STORAGE TANK WHEN THE VALVE WAS STRUCK BY A CONTRACTOR.
2/8/2000 15:15	UNKNOWN SHEEN	UNKNOWN	UNKNOWN SHEEN INCIDENT OUTSIDE THE MARINA	WATER	UNKNOWN OIL	UNKNOWN SHEEN
2/8/2000 14:50	UNKNOWN SHEEN	UNKNOWN	UNKNOWN SHEEN INCIDENT	WATER	UNKNOWN OIL	UNKNOWN SHEEN
10/19/1999 2:05	FIXED	UNKNOWN	NAVAL BASE	WATER	JET FUEL: JP-5 (KEROSENE, HEAVY)	AIRFIELD DAY TANK / CAUSE IS UNKNOWN
10/19/1999 2:00	FIXED	UNKNOWN	NAVAL BASE ROOSEVELT RDS	WATER	JET FUEL: JP-5 (KEROSENE, HEAVY)	STORAGE TANK / IT IS UNKNOWN WHAT CAUSED THE RELEASE, HOWEVER, 20000GALLONS OF JPV FUEL WAS RELEASED....THIS IS AN UPDATE TO REPORT 502839
9/29/1998 11:24	FIXED	EQUIPMENT FAILURE	USN ROOSEVELT ROADS NAVAL STATION / PIER 3 BERTH 3	WATER	JET FUEL: JP-5 (KEROSENE, HEAVY)	FUEL HOSE ON THE DOCK / MATERIAL SPILLED DUE TO A RUPTURE IN THE HOSE
7/23/1998 22:54	FIXED	EQUIPMENT FAILURE	PIER 1 NAVAL BASE	WATER	JET FUEL: JP-5 (KEROSENE, HEAVY)	TRANSFER HOSE / HOSE RUPTURED ON THE PIER

NAPR SPILL HISTORY						
Incident Date/Time	**Type of Incident**	**Incident Cause**	**Location**	**Medium Affected**	**Material Name**	**Description Of Incident**
7/23/1998 17:24	FIXED	EQUIPMENT FAILURE	PIER 1 NAVAL STATION	WATER	JET FUEL: JP-5 (KEROSENE, HEAVY)	CHICKSAND ON NAVY PIER / GASKET AT ELBOW FAILED
7/22/1998 13:45	VESSEL	OTHER	PSC 1008 BOX 3004 FPO AA 34051	WATER	BILGE SLOPS	TARGET SHIP / FAULTY STRUCTURE / DURING REMOVEL FROM WATER VESSEL BROKEIN HALF RELEASING BILGE SLOPS
6/16/1998 11:15	VESSEL	OPERATOR ERROR	PSC 1008 BOX 3004 FPO AA 34051	WATER	OIL, FUEL: NO. 2-D	USS LADY GULF / DURING REFUELING PROCESS, RESIDUE IN HOSE LEAKED OUTUPON DISCONECTION
6/16/1998 11:00	VESSEL	EQUIPMENT FAILURE	AFT STARBOARD QUARTERS PIER 3 / US NAVAL STATION ROOSEVELT ROADS	WATER	OIL: DIESEL	USS LEYTE GULF CRUSIER / TLI INDICATOR GOT STUCK / RELEASED 15-20GALS OF F76 DIESEL FUEL INTO ROOSEVELT HARBOR
5/29/1998 20:20	VESSEL	OPERATOR ERROR	NAVAL STATION	WATER	OIL, FUEL: NO. 2-D	M/V (ARC CAPITAN PABLO JOSE DE PORTO) / WHILE TRANSFERING FUEL AOCCURED
4/28/1998 19:40	VESSEL	EQUIPMENT FAILURE	ENSANADA HONDA PIER THREE	WATER	OIL: DIESEL	USS HAYLOR-OVERBOARD DISCHARGE CAUSED BY A FAULTY VALVE
4/18/1998 14:30	VESSEL	OPERATOR ERROR	USS DOYLE FFG 39 PIER 3, BERTH 1	WATER	OIL: DIESEL	OVERFLOW DISCHARGE/OVERFILLING DURING REFUELING
11/26/1997 10:30	VESSEL	EQUIPMENT FAILURE	SUPPORT DETATCHMENT PATROL BOAT PIER	WATER	OIL, MISC: LUBRICATING	USCGC VASHON / A HOSE RUPTURED

NAPR SPILL HISTORY						
Incident Date/Time	Type of Incident	Incident Cause	Location	Medium Affected	Material Name	Description Of Incident
11/26/1997 9:30	VESSEL	EQUIPMENT FAILURE	COAST GUARD PIER AT NAVAL STATION ROOSEVELT ROADS	WATER	OIL, MISC: LUBRICATING	WHILE CONDUCTING LUBE OIL CHANGE THE HOSE REMOVING THE USED OILRUPTURED RELEASING MATERIAL TO THE WATER
11/3/1997 10:00	UNKNOW N SHEEN	UNKNOWN	PIER #3 ROOSEVELT ROADS NAVAL STA	WATER	OIL, FUEL: NO. 2-D	USS BRISCOE / AFTER COMPLETING FUELING OPERATIONS A SHEEN WAS SPOTTEDBY THE VESSEL
9/10/1997 10:42	VESSEL	OPERATOR ERROR	NAVSTA PIER 1 OUTSIDE THE FUELING BARGE	WATER	OIL, FUEL: NO. 2-D(MARINE)	TUGBOAT YFU803 / SPILLED FUEL DURING REFUELING
6/19/1997 23:15	AIRCRAFT	OTHER	TENT CITY INSIDE AIRPORT	LAND	JET FUEL: JP-5 (KEROSENE, HEAVY)	F-14 RELIEF VALVE/ OVERPRESSURIZATION OF DROP TANK WHILE "PARKED"
5/15/1997 11:20	VESSEL	UNKNOWN	PSC 1008 PIER 1	WATER	DFM FUEL	FUEL BARGE 271 / RELEASE OCCURRED DUE TO UNKNOWN CAUSES
5/13/1997 6:00	VESSEL	OPERATOR ERROR	PSC 1008 BOX 3004 FPO AA 34051	WATER	OIL: DIESEL	SOURCE: DAY TANK (TANK CAPACITY: UNK)/CAUSE: DURING FUELING OPERATIONSFUEL WAS SPILLED ON BOARD THE TUG 809
5/9/1997 11:21	VESSEL	EQUIPMENT FAILURE	ROOSEVELT ROADS NAVSTA PIER 2	WATER	OIL: DIESEL	FUEL BARGE #113/VALVE LEAKED DURING TRANSFER TO USS DE WERT (FFG-45)
3/10/1997 4:15	VESSEL	OPERATOR ERROR	FUEL PIER, BERTH NAVSTA ROOSEVELT ROADS	WATER	JET FUEL: JP-5 (KEROSENE, HEAVY)	HMS PROVIDER / 2 55 GALLONS DRUM FELL INTO WATER FROM VESSEL / DRUMSCONTAINED JP-V FROM INTERNAL TRANSFER OPERATIONS
1/21/1997 9:00	VESSEL	OPERATOR ERROR	FUEL PIER BERTH 1	WATER	JET FUEL: JP-5 (KEROSENE, HEAVY)	USS YORKTOWN CG-48/FUEL TANK OVERFLOWED DURING FUELING OPS

NAPR SPILL HISTORY						
Incident Date/Time	**Type of Incident**	**Incident Cause**	**Location**	**Medium Affected**	**Material Name**	**Description Of Incident**
1/10/1997 10:33	VESSEL	UNKNOWN	NAVSTA ROOSEVELT ROADS PIER 2 BERTH 1	WATER	JET FUEL: JP-5 (KEROSENE, HEAVY)	VALVE ON INTERNAL FUEL SYSTEM PIPING / THE PIPING WAS MISALIGNED DURINGA TRANSFER CAUSING THE RELEASE OF THE MATERIAL FM THE VSL
1/1/1997 13:15	VESSEL	UNKNOWN	PSC 1008 BOX 3004 FPO, AA 34051	WATER	UNKNOWN OIL	OIL WATER SEPARATOR MALFUNCTIONED WHILE TRANSFERING TO STORAGE TANKS
12/26/1996 16:30	VESSEL	OPERATOR ERROR	PSC 1008 BOX 3004 FPO, AA 34051	WATER	OIL: DIESEL	400FT BRITISH NAVAL WARSHIP DIESEL OVERFLOW TANK / OVERFILLED THE TANKWHEN TAKING ON BALLAST WATER
12/1/1996 16:55	VESSEL	OTHER	PIER 1 NAV STATION	WATER	OIL: DIESEL	USS ARCTIC / FUEL TANK VENT / CAUSED BY SOUNDING TUBE BLOCKAGE
11/24/1996 13:00	VESSEL	UNKNOWN	FUEL PIER	WATER	UNKNOWN OIL	UNKNOWN / UNKNOWN SHEEN SIGHTING, SHEEN SIZE:5FT X 5FT, CLR:RAINBOWSHEEN WAS CONTAINED IN BOOM PREVIOUSLY DEPLOYED AT MOORING
10/29/1996 13:45	VESSEL	OPERATOR ERROR	FUEL PIER 1A	WATER	OIL, FUEL: NO. 2-D	TUG JENNA B. / OVERFILLED FUEL TANK
10/23/1996 15:00	VESSEL	OPERATOR ERROR	FUEL PIER 1	WATER	WASTE OIL	USCGC HAMILTON/REMOVED HOSE WHILE PUMP RUNNING DURING BILGE PUMPINGOPERATION
3/1/1996 8:30	VESSEL	OTHER	NAVAL STATION ROOSEVELT ROADS	WATER	OIL: DIESEL	USCGC NUNIVAC / VALVE IN FUEL MANIFOLD MAY BE LEAKING CAUSING OVERFLOWOF TANK
12/22/1995 14:30	UNKNOW N SHEEN	UNKNOWN	PSC 1008 BOX 3004 FPO-AA	WATER	UNKNOWN OIL	UNKNOWN / UNKNOWN SHEEN SIGHTING, SHEEN SIZE: 150FT X 150FTCOLOR: DARK BROWN WINDS: S.W. AT 7-11KTS

NAPR SPILL HISTORY						
Incident Date/Time	Type of Incident	Incident Cause	Location	Medium Affected	Material Name	Description Of Incident
12/6/1995 9:00	VESSEL	EQUIPMENT FAILURE	NAVAL STA ROOSEVELT ROADS PIER 2 BERTH 1	WATER	OIL: DIESEL	FRG ZERSTORER MOLDER / CORROSION CAUSED FUEL TO LEAK INTO FLUSHINGSYSTEM / SHEEN SIZE: 50FT X 100FT, DULL BROWN IN COLOR
10/13/1995 8:30	FIXED	NATURAL PHENOMEN ON	PSC 1008 BOX 3004 FPO-AA	WATER	WASTE OIL	FUEL SEPERATOR/HEAVY RAINFALL CAUSED OVERRUN
9/22/1995 1:00	FIXED	OPERATOR ERROR	PSC 1008 BOX 3004 FPO-AA	LAND	JET FUEL: JP-5 (KEROSENE, HEAVY)	WHILE FUELING A TANK TRUCK OPERATOR FELL ASLEEP ALLOWING 830 GALLONSOF JP5 TO SPILL TO THE CONCRETE
9/19/1995 15:00	VESSEL	OTHER	ARMY RESERVE LCM RAMP NAVAL STATION	WATER	OIL, FUEL: NO. 2-D	M/V HULL #LCM8552 / WHILE FUELING MATERIALS WERE RELEASED
8/16/1995 16:00	AIRCRAFT	EQUIPMENT FAILURE	USN-STA ROOSEVELT ROADS	WATER	JET FUEL: JP-4	BQM74E DRONE/FAILED TO LAUNCH
8/6/1995 15:00	VESSEL	OPERATOR ERROR	NAVSTA ROOSEVELT ROADS PIER 3 BERTH 3	WATER	DICHLOROMONOFL UOROMETHANE	USS PAUL HAMILTON / OVERFLOW OF LAST STORAGE TANK IN FUEL GROUP 4
8/5/1995 11:45	VESSEL	UNKNOWN	PIER 3	WATER	OIL, FUEL: NO. 2-D	USS PAUL HAMILTON/UNKNOWN
8/5/1995 11:00	VESSEL	UNKNOWN	USS PAUL HAMILTON DDG60	WATER	OIL: DIESEL	SALT WATER COMPENSATING SYSTEM / DURING REFUELING OPERATIONS / CAUSEUNKNOWN
7/28/1995 22:00	FIXED	OPERATOR ERROR	FPO AA	LAND	OIL, MISC: TRANSFORMER	POLE MOUNTED TRANSFORMER RUPTURED/STRUCK BY A VEHICLE
7/19/1995 17:00	UNKNOW N SHEEN	UNKNOWN		WATER	UNKNOWN OIL	UNKNOWN / UNKNOWN SHEEN SIGHTING, SHEEN SIZE:10 FT X 20 FT

NAPR SPILL HISTORY						
Incident Date/Time	**Type of Incident**	**Incident Cause**	**Location**	**Medium Affected**	**Material Name**	**Description Of Incident**
7/19/1995 12:30	VESSEL	UNKNOWN	USN - STA ROOSEVELT ROADS PIER 3 BERTH 3	WATER	OIL, MISC: MOTOR	VEHICLES IN WELL DECK OF USS ASHLAND/LIST OF SHIP CAUSED VEHICLES TOSPILL OIL
6/23/1995 18:35	MOBILE	EQUIPMENT FAILURE	PIER 3 BERTH 4 ROOSEVELT ROADS	WATER	WASTE OIL	WASTE OIL TANK TRUCK//TANK TRUCK HAD A VALVE FAILURE
5/3/1995 12:30	VESSEL	UNKNOWN	PIER 1	WATER	JET FUEL: JP-5 (KEROSENE, HEAVY)	TANK ON BOARD OVERFLOWED/UNKNOWN
4/5/1995 16:15	MOBILE	EQUIPMENT FAILURE	RUNWAY NO. 3	LAND	JET FUEL: JP-5 (KEROSENE, HEAVY)	FUEL TANK TRUCK//LEAK DEVELOPED IN VALVE
3/20/1995 15:00	FIXED	OPERATOR ERROR	PSC 1008 BOX 3004 FPO-AA	WATER	OIL: DIESEL	OILY WATER SEPERATOR / OVERFLOW
3/20/1995 15:00	FIXED	OPERATOR ERROR	PSC 1008 BOX 3004 FPO-AA	WATER	OIL: DIESEL	OILY WATER SEPERATOR / OVERFLOW
2/10/1995 22:15	MOBILE	OPERATOR ERROR	PIER 2 BOX 3004 FPO-AA	LAND		COLLECTING TANKER ON PIER// MONITORING ERROR ALLOWED TANK TO OVERFLOWNONE GOT INTO WATER / ALL CONTAINED ON PIER
2/1/1995 8:40	VESSEL	OPERATOR ERROR	PSC 1008 BOX 3004 FPO-AA	WATER		BALLAST TANK/OVERFLOW
1/23/1995 17:32	FIXED	OPERATOR ERROR	BLDG 3179 US NAVAL STATION	LAND	OIL: DIESEL	FUEL DAY TANK/OVERFLOWED DUE TO MONITORING ERROR
1/14/1995 22:30	FIXED	EQUIPMENT FAILURE	PSC 1008 BOX 3004 FPO-AA	LAND	JET FUEL: JP-5 (KEROSENE, HEAVY)	STORAGE TANK/TANK OVERFLOWED DUE TO FILTERING SYSTEM FAILURE
10/24/1994 8:00	UNKNOWN SHEEN	UNKNOWN	NEAR PIER 3	WATER	UNKNOWN OIL	UNKNOWN / UNKNOWN SHEEN SIGHTING, SHEEN SIZE: 100 FT X 200 FT/BARELY VISIBLE SHEEN

NAPR SPILL HISTORY						
Incident Date/Time	**Type of Incident**	**Incident Cause**	**Location**	**Medium Affected**	**Material Name**	**Description Of Incident**
10/24/1994 2:30	VESSEL	UNKNOWN	PIER 3	WATER	OIL, FUEL: NO. 2-D	USS STOUT HAD A VENT OVERFLOW WHILE FUELING
9/12/1994 10:50	FIXED	OPERATOR ERROR	NAVSTA PIER 1	WATER	OIL: DIESEL	8 INCH FUEL LINE/RESIDUAL MATERIAL WAS ACCIDENTALLY RELEASED DURINGMAINTENANCE WORK ON THE LINE
8/6/1994 4:10	MOBILE	OPERATOR ERROR	FUEL INDUSTIAL GAS STA BLDG 124	LAND	OIL, FUEL: NO. 2-D	NON HAZMAT CARRIER/OVERFILLED DUE TO OPERATOR FALLING ASLEEP
7/24/1994 18:50	MOBILE	OPERATOR ERROR	AIRFIELD ROOSY ROADS PIT 2	LAND	JET FUEL: JP-5 (KEROSENE, HEAVY)	NAVY CREWS OVERFLOWED TANK TRUCK AT AIRFIELD PIT 2
7/22/1994 10:00	VESSEL	DUMPING	NAVSTA ROOSY ROADS PIER 3 BERTH 2	WATER	OTHER OIL (OIL FROM BILGES)	M/V SOUBLET, A VENEZUELAN NAVY SHIP PUMPED ITS BILGES IN HARBOR
7/8/1994 15:45	VESSEL	EQUIPMENT FAILURE	USN-STA ROOSEVELT ROADS ENSANADA HONDA	WATER	OIL: DIESEL	MARINE RECREATION BOAT SUFFERED BROKEN FUEL LINE RESULTING IN RELEASE
6/10/1994 20:37	MOBILE	OPERATOR ERROR	SEABEE CAMP USN ROOSEVELT ROADS	WATER	OIL: DIESEL	FUEL TRUCK/ SEABEES WERE IN PROCESS OF TRANSFERING FUEL TO ANOTHERTRUCK/ OVERFILLED RECEIVING TRUCK
3/18/1994 5:00	VESSEL	OPERATOR ERROR	PIER 1 BIRTH 1	WATER	WASTE OIL	USS DETROIT/WASTE OIL WAS ACCIDENTLY PUMPED FROM THE BILGES
2/11/1994 15:00	VESSEL	EQUIPMENT FAILURE	PIER 1	WATER	OIL: DIESEL	USS MERRIMACK/WHILE REFUELING THE TANK OVERFLOWED
12/6/1993 8:00	FIXED	EQUIPMENT FAILURE	PIER 3 BERTH 4 USN STA ROOSEVELT	WATER	OIL, FUEL: NO. 2-D	PIPE AT PIER / PIPE RUPTUREDSHEEN SIZE: UNKNOWN

NAPR SPILL HISTORY						
Incident Date/Time	**Type of Incident**	**Incident Cause**	**Location**	**Medium Affected**	**Material Name**	**Description Of Incident**
10/26/1993 22:45	AIRCRAFT	EQUIPMENT FAILURE	FUEL PIT NO. 1 NAVSTA ROOSEVELT RDS	LAND	JET FUEL: JP-5 (KEROSENE, HEAVY)	KC135R AIRCRAFT / HOSE FAILED
10/18/1993 9:55	VESSEL	OPERATOR ERROR	PIER 2 NAVSTA ROOSEVELT ROADS	WATER	OIL, FUEL: NO. 2	USS MOHAWK/MONITORED FUEL TANK INCORRECTLY AND RESULTED IN A FUELVENT OVERFLOW
10/4/1993 10:42	VESSEL	OPERATOR ERROR	PIER 3 BERTH 3	WATER	OIL: DIESEL	FUEL VENT ON SHIP / RELEASE OCCURRED DURING FUEL OPS
10/1/1993 7:40	FIXED	NATURAL PHENOMEN ON	WYFU BOX 3004 FPO-AA	WATER	OIL: DIESEL	UNDERGROUND STORAGE TANK / HEAVY RAINS CAUSED TANK TO RELEASE MAT'L
9/28/1993 9:50	FIXED	NATURAL PHENOMEN ON	NEAR PIER 1 WEAPONS RUN	WATER	JET FUEL: JP-5 (KEROSENE, HEAVY)	DURING RAIN STORM MAT'L THAT HAS BEEN SOAKED INTO THE GROUND WAS WASHEDINTO THE OCEAN
9/26/1993 12:10	AIRCRAFT	EQUIPMENT FAILURE	BLDG 380	LAND	JET FUEL: JP-5 (KEROSENE, HEAVY)	UNKNOWN TYPE OF AIRCRAFT BEING REFUELED / CHECK VALVE FAILED
9/15/1993 16:30	VESSEL	EQUIPMENT FAILURE	USN-ROOSEVELT ROADS PIER 1	WATER	OIL: DIESEL	USCGC VASHON/AIR BUBBLE OCCURRED IN FUEL LINE AND CAUSED VENT TOBURP
6/16/1993 11:50	VESSEL	OPERATOR ERROR	PSC 1008 BOX 3004 COAST GUARD PIER	WATER	OIL, FUEL: NO. 2-D	FUEL TANK/TANK WAS OVERFILLEDSHEEN SIZE: 4' X 3' / BROWN COLOR
6/4/1993 9:15	VESSEL	OPERATOR ERROR	PIER 1 BERTH 1	WATER	OIL: DIESEL	THE USS SCOTT RELEASED MATERIAL WHILE TAKING ON FUEL
5/4/1993 17:00	VESSEL	EQUIPMENT FAILURE	PIER 3 BERTH 4	WATER	OIL: DIESEL	THE USS SAVANNAH HAD A LEAKING FITTING ON A FUELING HOSE
3/18/1993 8:30	FIXED	EQUIPMENT FAILURE	US NAVAL STATION WATER PLANT	AIR	CHLORINE	CYLINDER / HOLE IN IT

NAPR SPILL HISTORY						
Incident Date/Time	**Type of Incident**	**Incident Cause**	**Location**	**Medium Affected**	**Material Name**	**Description Of Incident**
2/1/1993 16:12	MOBILE	EQUIPMENT FAILURE	NAVAL STATION HANGER 200	LAND	JET FUEL: JP-5 (KEROSENE, HEAVY)	FUEL TRUCK/STRUCTURE FAILURE OF PTO GEAR
12/15/1992 11:30	MOBILE	OPERATOR ERROR	RED BALL AIRFIELD	LAND	JET FUEL: JP-5 (KEROSENE, HEAVY)	TANK TRUCK / OVERFILLED
12/12/1992 12:00	AIRCRAFT	OPERATOR ERROR	AIRFIELD SPOT 1	LAND	JET FUEL: JP-5 (KEROSENE, HEAVY)	C-9 AIRCRAFT/ OVERFILLED TANKS
12/12/1992 11:30	MOBILE	OPERATOR ERROR	AIRFIELD BACK T LINE	LAND	JET FUEL: JP-5 (KEROSENE, HEAVY)	FUEL TRUCK / OVERFILLED
11/17/1992 13:30	FIXED	OPERATOR ERROR	USN NAVSTA ROOSEVELT RDS PIER CHARLIE	WATER	OIL: DIESEL	PORTABLE TANK / TIPPED OVER WHILE BEING LIFTED
11/13/1992 10:20	VESSEL	EQUIPMENT FAILURE	USN-STA ROOSEVELT ROADS	WATER	OIL, FUEL: NO. 2-D	USCGC LEGARE / PRODUCT "BURPED" OUT OF AIR VENTS
8/26/1992 16:00	VESSEL	EQUIPMENT FAILURE	USN-ROOSEVELT RDS 1500 YDS OFF SHORE	WATER	HYDRAULIC OIL	LINE ON VIBRATING HAMMER / LINE BROKE
8/21/1992 14:15	VESSEL	UNKNOWN	PIER 1 NAV STA ROOSEVELT RDS	WATER	HYDRAULIC OIL	TANK BARGE/SPILL DUE TO UNKNOWN CAUSE
2/28/1992 13:48	VESSEL	EQUIPMENT FAILURE	NAVSTA ROOSEVELT ROADS	WATER	OIL: DIESEL	USNS SEA LIFT MEDITERRANEAN/TANK OVERFLOW
10/24/1991 22:00	FIXED	EQUIPMENT FAILURE	PIER 3 BERTH 3	WATER	UNKNOWN OIL	CARGO FUEL TANK OVERFLOWED WHILE TAKING ON FUEL

APPENDIX H
DATA SHEETS, DRAWINGS, AND PHOTOS

Active Tanks

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	1090A
Grid:	4F
Installation Year:	2004
Tank Type:	AST
Location:	Marina
Capacity:	3000
Facility Organization:	AAFES
Contents:	Gasoline
Facility:	AAFES
Current Use:	Fueling - Marine
Nearest Building:	2334

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	Aggregate Finish
Construction Material:	Concrete/Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	120"x92"x66"
Tank Manufacturer:	ConVault
Lining:	None
Model Number:	Core

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge
Area Lighting:	Adequate
Collision Barrier:	Inadequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	None
Gauge Manufacturer:	Krueger
HLA Manufacturer:	N/A
Gauge Model:	Unknown
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Interstitial Popup/ Visual Inspection
Next Gauge Calibration:	2011
Tank LD Manfuacturer:	Krueger
Pump Starter Control:	Locked Whenever Off
Tank LD Model:	Unknown
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	SW Steel
Pipe Condition:	Good
Pipe Length:	14'
Pipe Corrosion Protection:	None
Supply Pipe Diameter:	1.5"
Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	1.5"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	Containment Area
Loading/Unloading Containment Recommendations	Stage spill kit in containment area

Continuation of Tank ID: 1090A

DISPENSNG TANK SYSTEMS

Dispenser:	Multi Product	VRS Stage 1:	Yes	Hose Retractor:	Yes
Number of Dispenser	1	VRS Stage 2:	No	Shear Valve:	No
Nozzles per Dispensers:	2	Emergency Shutoff:	Yes	Nozzle Swivel Connector:	Yes
				Break Away Coupling:	No

SPILL RESPONSE INFORMATION

Initial Spill Direction	West	Probablity of Reaching Water:	Very High
Initital Receptor:	Ground at Tank	Spill Equipment:	None
Intitial Conveyance:	Overland Flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	2400		

BMP Recommendations

Provide spill kit. Repair/replace tank gauges. Paint piping for corrosion protection.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A

Quick Find	
Status	Active

GENERAL SYSTEM INFORMATION

Tank ID:	1090B	Grid:	4F	Installation Year:	2004
Tank Type:	AST	Location:	Marina		
Capacity:	2000	Facility Organization:	AAFES		
Contents:	Diesel	Facility:	AAFES		
Current Use:	Fueling - Marine	Nearest Building:	2334		

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good	Tank Color:	Aggregate Finish
Construction Material:	Concrete/Steel	Tank Manifolded:	No		
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material		
Tank Dimension:	120"x92"x66"	Tank Manufacturer:	ConVault		
Lining:	None	Model Number:	Core		

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge	Area Lighting:	Adequate	Collision Barrier:	Inadequate
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	None		
Gauge Manufacturer:	Krueger	HLA Manufacturer:	N/A		
Gauge Model:	Unknown	HLA Model:	N/A		
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Interstitial Popup/ Visual Inspection		
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	Krueger		
Pump Starter Control:	Locked Whenever Off	Tank LD Model:	Unknown		
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment		

PIPING SYSTEM

Piping Exposure:	Aboveground			Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	12'	Pipe Corrosion Protection:	None
Supply Pipe Diameter:	1.5"	Pipe Sumps:	N/A	Piping Leak Detection:	Visual Inspection
Return Pipe Diameter:	1.5"			Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction			Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Containment Area		
Loading/Unloading Containment Recommendations	Stage spill kit in containment area		

Continuation of Tank ID: 1090B

DISPENSNG TANK SYSTEMS

Dispenser: Multi Product

Number of Dispenser: 1

Nozzles per Dispensers: 2

VRS Stage 1: Yes

VRS Stage 2: No

Emergency Shutoff: Yes

Hose Retractor: Yes

Shear Valve: No

Nozzle Swivel Connector: Yes

Break Away Coupling: No

SPILL RESPONSE INFORMATION

Initial Spill Direction: West

Probablity of Reaching Water: Very High

Initital Receptor: Ground at Tank

Spill Equipment: None

Intitial Conveyance: Overland Flow

Ultimate Discharge: SF-004 Ensenada Honda

Worst Case Discharge/Rate of Flow: 1600

BMP Recommendations

Provide spill kit. Paint piping for corrosion protection.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency: Monthly

Monthly Leak Detection Monitoring: Visual Inspection

CP Bimonthly System Check: N/A

Last Cathodic Protection Test: N/A

Next Cathodic Protection Test: N/A

Last Spill Bucket Test: N/A

Next Spill Bucket Test: N/A

Last Containment Sump Test: N/A

Next Containment Sump Test: N/A

Last Formal External API 653: N/A

Next Formal External API 653: N/A

Last Formal Piping Inspection: N/A

Next Formal Piping Inspection: N/A

STI Inspection Category: N/A

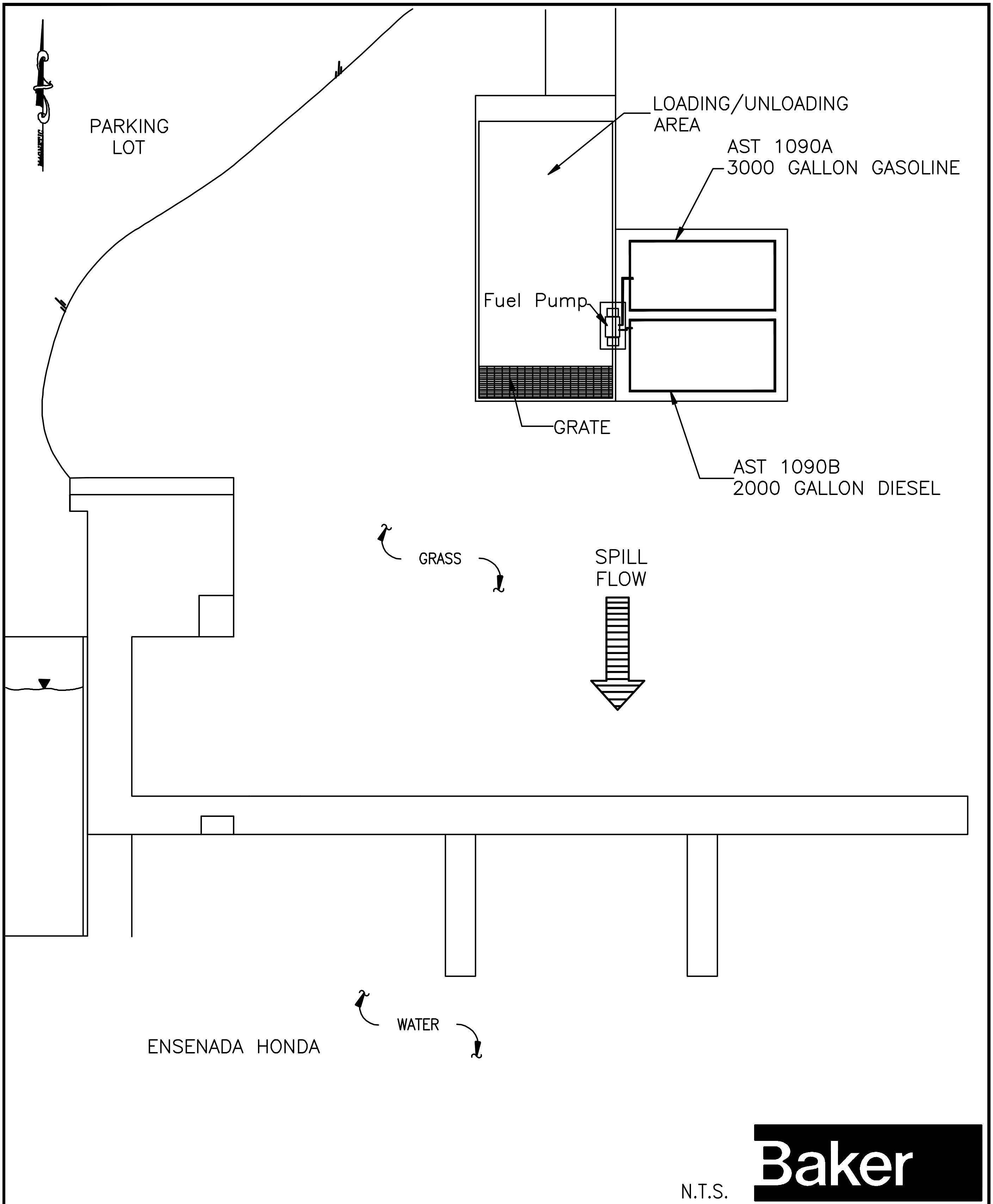
STI Inspection Schedule: N/A

STI Internal Inspection: N/A

STI External Inspection: N/A

Last STI Inspection: N/A

Next STI Inspection: N/A



	Project: SPCC PLAN NAVAL ACTIVITIY PUERTO RICO CEIBA, PUERTO RICO	Title: STORAGE TANK SITE LOCATION PLAN FOR AST's 1090A & 1090B
	Date: December 2010	


FILL
CAUTION
BE IN ATTENDANCE DURING ALL FUEL
DELIVERY OPERATIONS.
DO NOT DRILL HOLES IN CONCRETE
GASOLINE
DANGER
WITHIN 50 FEE
Baker
AST
1090 A

AST 1090 A

AST 1090 B

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	1205
Grid:	5G
Installation Year:	1999
Tank Type:	AST
Location:	Administration Building
Capacity:	1000
Facility Organization:	Unknown (BOSC)
Contents:	Diesel
Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation
Nearest Building:	1205

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	White
Construction Material:	Concrete/Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 5'8" x 4'4"
Tank Manufacturer:	ConVault
Lining:	N/A
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge, High Level Alarm
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	Visible Gauge, High Level Alarm
Gauge Manufacturer:	Krueger
HLA Manufacturer:	Warrick Controls
Gauge Model:	Unknown
HLA Model:	DMS-573
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Electronic leak Detection
Next Gauge Calibration:	2011
Tank LD Manfuacturer:	Warrick Controls
Pump Starter Control:	At Generator
Tank LD Model:	DMS-573
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	SW Steel
Pipe Condition:	Good
Pipe Length:	22'
Pipe Corrosion Protection:	Paint
Supply Pipe Diameter:	3/4"
Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	3/4"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 1205

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Moderate
Initital Receptor:	Ground at Tank	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	800		

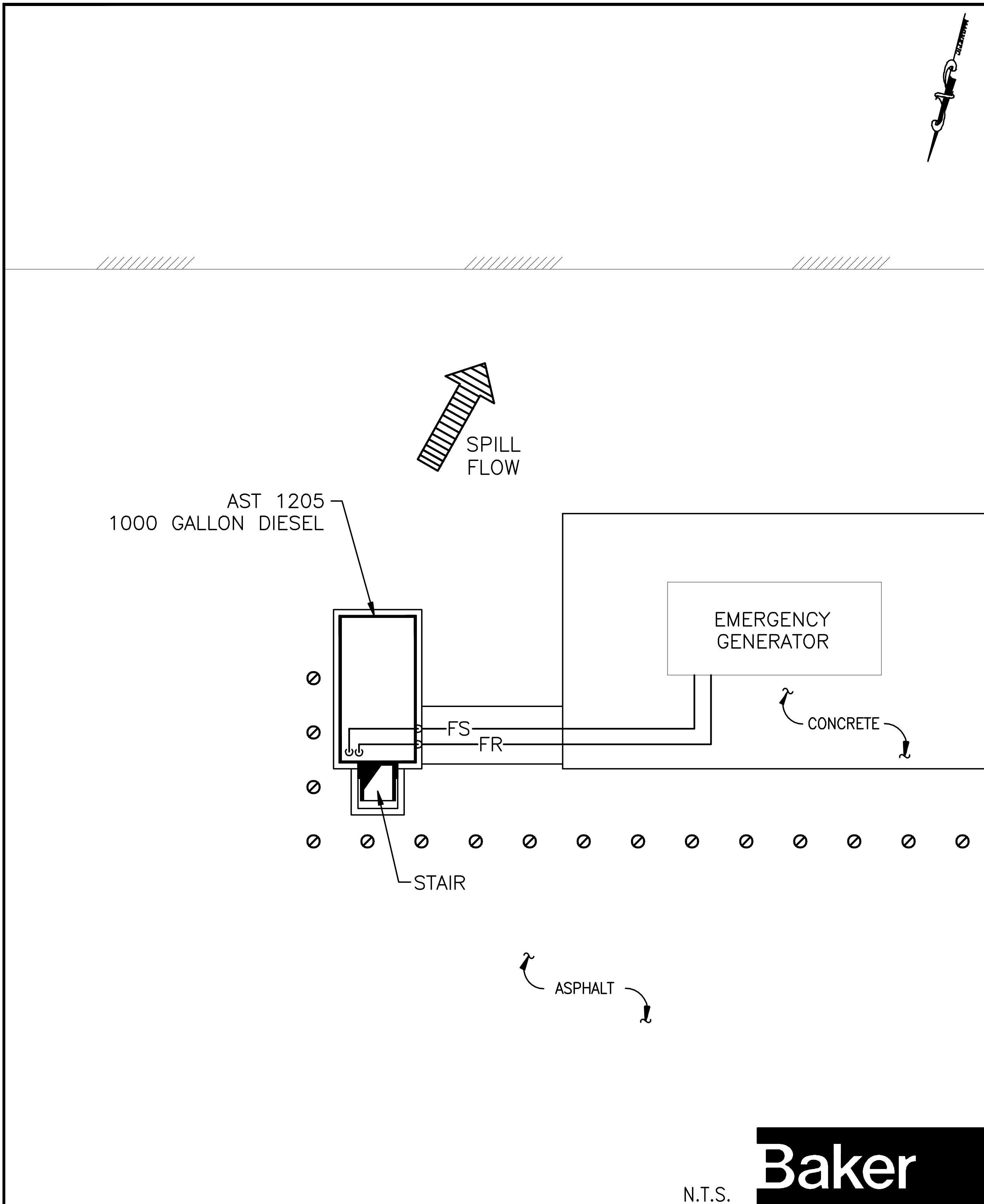
BMP Recommendations

Operations and maintenance on leak detection system.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



LEGEND:

— FS — - Fuel Supply
— FR — - Fuel Return
⊘ - Bollards

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title: STORAGE TANK SITE LOCATION PLAN FOR AST 1205

AST 1205

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	1207
Grid:	5G
Installation Year:	1998
Tank Type:	AST
Location:	Building 1207
Capacity:	500
Facility Organization:	Unknown
Contents:	Diesel
Facility:	Unknown
Current Use:	Emergency Power Generation
Nearest Building:	1207

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	No
Contents Label:	No
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Fair
Tank Color:	White
Construction Material:	Steel
Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder
Corrosion Protection:	Painted
Tank Dimension:	92" x 74"
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Numbered Wheel Display
HLA Type:	None
Gauge Manufacturer:	Scully
HLA Manufacturer:	N/A
Gauge Model:	Uni-Guage
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	2011
Tank LD Manfuacturer:	N/A
Pump Starter Control:	Inside Locked Building
Tank LD Model:	N/A
Valves Surface Security:	No
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	SW Copper
Pipe Condition:	Good
Pipe Length:	20'
Pipe Corrosion Protection:	Paint
Supply Pipe Diameter:	1/2"
Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	1/2"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Dike Tank
Containment Dimensions	7'5" x 6' x 1'8"
Drain Mechanism:	Drain Valve
Containment Volume:	550
Drainage Outfall:	Ground Outside Dike
Drain Security:	No
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 1207

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southwest	Probablity of Reaching Water:	Low
Initital Receptor:	Ground at Tank	Spill Equipment:	
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	400		

BMP Recommendations

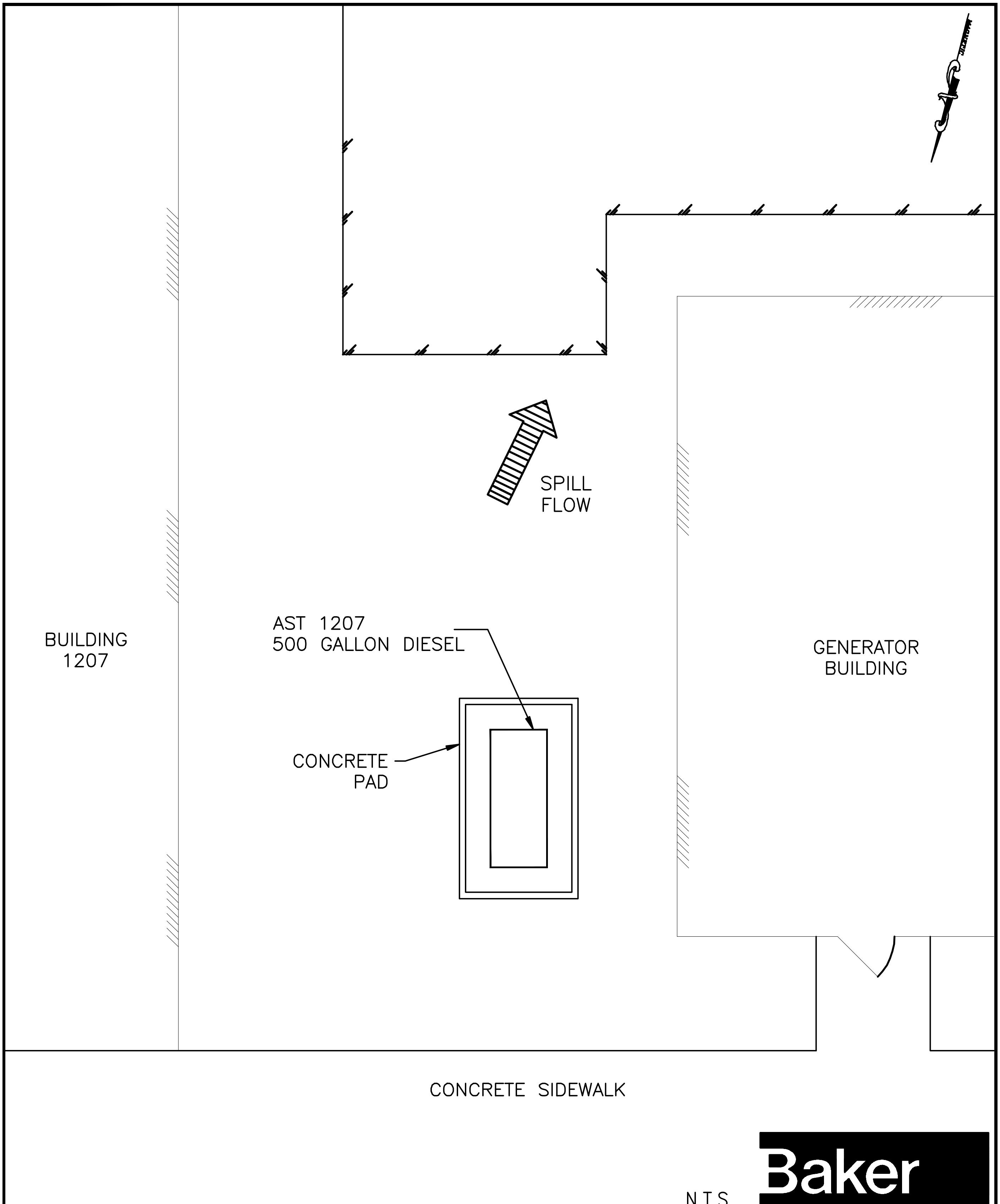
Mark oil type, recoat/repair secondary containment, replace missing fittings, provide lock for secondary containment valve. Operations and maintenance on leak detection system.

Notes:

Runs to 25 gallon day tank inside of building.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	1
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	Periodic/External
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	20 Years
Next Containment Sump Test:	N/A	Last STI Inspection:	Unknown
		Next STI Inspection:	2011



Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title: STORAGE TANK SITE LOCATION PLAN FOR AST 1207

AST 1207

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	124A
Grid:	5G
Installation Year:	1996
Tank Type:	UST
Location:	Building 124
Capacity:	2500
Facility Organization:	BOSC
Contents:	Diesel
Facility:	BOSC Fueling Station
Current Use:	Fueling - Motor Vehicle
Nearest Building:	124

LABELING AND CODING

Tank ID Label:	Yes
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Unknown
Tank Color:	N/A
Construction Material:	FRP
Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder
Corrosion Protection:	Unknown
Tank Dimension:	Unknown
Tank Manufacturer:	Unknown
Lining:	N/A
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-level Alarm
Area Lighting:	Adequate
Collision Barrier:	N/A
Liquid Level Gauge Type:	Automatic Tank Gauge
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Veeder-Root
HLA Manufacturer:	Veeder-Root
Gauge Model:	TLS 350
HLA Model:	TLS 350
Last Gauge Calibration:	2010
Tank Leak Detection:	Veeder-Root
Next Gauge Calibration:	2011
Tank LD Manfuacturer:	Veeder-Root
Pump Starter Control:	Inside Building
Tank LD Model:	TLS 350
Valves Surface Security:	Yes
Spill Catchment:	Spill Bucket

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	Unknown
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Unknown
Supply Pipe Diameter:	Unknown
Pipe Sumps:	
Piping Leak Detection:	Veeder-Root
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	Yes
Delivery System:	Pressure
Annual Line Leak Detectors Testing:	Yes

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	Spill Kits
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 124A

DISPENSNG TANK SYSTEMS

Dispenser:	Single Product	VRS Stage 1:	Yes	Hose Retractor:	No
Number of Dispenser	1	VRS Stage 2:	Yes	Shear Valve:	No
Nozzles per Dispensers:	2	Emergency Shutoff:	Yes	Nozzle Swivel Connector:	Yes
				Break Away Coupling:	No

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southeast	Probablity of Reaching Water:	Low
Initital Receptor:	N/A	Spill Equipment:	Spill Kit
Intitial Conveyance:	N/A	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:			

BMP Recommendations

Provide Spill Kit for Loading/Unloading operations.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Electronic	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	2010
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	2011
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	Unknown	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	2011	STI Internal Inspection:	N/A
Last Containment Sump Test:	Unknown	STI External Inspection:	N/A
Next Containment Sump Test:	2011	Last STI Inspection:	N/A
		Next STI Inspection:	N/A

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	124B	Grid:	5G
Installation Year:	1996		
Tank Type:	UST	Location:	Building 124
Capacity:	6000	Facility Organization:	BOSC
Contents:	Gasoline	Facility:	BOSC Fueling Station
Current Use:	Fueling - Motor Vehicle	Nearest Building:	124

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Unknown
Tank Color:	N/A		
Construction Material:	FRP	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Unknown
Tank Dimension:	Unknown	Tank Manufacturer:	Unknown
Lining:	N/A	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-level Alarm	Area Lighting:	Adequate
Collision Barrier:	N/A		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Veeder-Root	HLA Manufacturer:	Veeder-Root
Gauge Model:	TLS 350	HLA Model:	TLS 350
Last Gauge Calibration:	2010	Tank Leak Detection:	Veeder-Root
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	Veeder-Root
Pump Starter Control:	Inside Building	Tank LD Model:	TLS 350
Valves Surface Security:	Yes	Spill Catchment:	Spill Bucket

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	Unknown
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	Unknown		
Supply Pipe Diameter:	Unknown	Pipe Sumps:	
Piping Leak Detection:	Veeder-Root		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Yes
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Yes

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Spill Kits		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 124B

DISPENSNG TANK SYSTEMS

Dispenser:	Single Product	VRS Stage 1:	Yes	Hose Retractor:	No
Number of Dispenser	1	VRS Stage 2:	Yes	Shear Valve:	No
Nozzles per Dispensers:	2	Emergency Shutoff:	Yes	Nozzle Swivel Connector:	Yes
				Break Away Coupling:	No

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southeast	Probablity of Reaching Water:	Low
Initital Receptor:	N/A	Spill Equipment:	Spill Kit
Intitial Conveyance:	N/A	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:			

BMP Recommendations

Provide Spill Kit for Loading/Unloading operations.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Electronic	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	2010
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	2011
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	Unknown	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	2011	STI Internal Inspection:	N/A
Last Containment Sump Test:	Unknown	STI External Inspection:	N/A
Next Containment Sump Test:	2011	Last STI Inspection:	N/A
		Next STI Inspection:	N/A

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	124C
Grid:	5G
Installation Year:	1996
Tank Type:	UST
Location:	Building 124
Capacity:	6000
Facility Organization:	BOSC
Contents:	Gasoline
Facility:	BOSC Fueling Station
Current Use:	Fueling - Motor Vehicle
Nearest Building:	124

LABELING AND CODING

Tank ID Label:	Yes
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Unknown
Tank Color:	N/A
Construction Material:	FRP
Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder
Corrosion Protection:	Unknown
Tank Dimension:	Unknown
Tank Manufacturer:	Unknown
Lining:	N/A
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-level Alarm
Area Lighting:	Adequate
Collision Barrier:	N/A
Liquid Level Gauge Type:	Automatic Tank Gauge
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Veeder-Root
HLA Manufacturer:	Veeder-Root
Gauge Model:	TLS 350
HLA Model:	TLS 350
Last Gauge Calibration:	2010
Tank Leak Detection:	Veeder-Root
Next Gauge Calibration:	2011
Tank LD Manfuacturer:	Veeder-Root
Pump Starter Control:	Inside Building
Tank LD Model:	TLS 350
Valves Surface Security:	Yes
Spill Catchment:	Spill Bucket

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	Unknown
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Unknown
Supply Pipe Diameter:	Unknown
Pipe Sumps:	
Piping Leak Detection:	Veeder-Root
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	Yes
Delivery System:	Pressure
Annual Line Leak Detectors Testing:	Yes

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	Spill Kits
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 124C

DISPENSNG TANK SYSTEMS

Dispenser:	Single Product	VRS Stage 1:	Yes	Hose Retractor:	No
Number of Dispenser	1	VRS Stage 2:	Yes	Shear Valve:	No
Nozzles per Dispensers:	2	Emergency Shutoff:	Yes	Nozzle Swivel Connector:	Yes
				Break Away Coupling:	No

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southeast	Probablity of Reaching Water:	Low
Initital Receptor:	N/A	Spill Equipment:	Spill Kit
Intitial Conveyance:	N/A	Ultimate Discharge	Ensenada Honda

Worst Case Discharge/Rate of Flow:

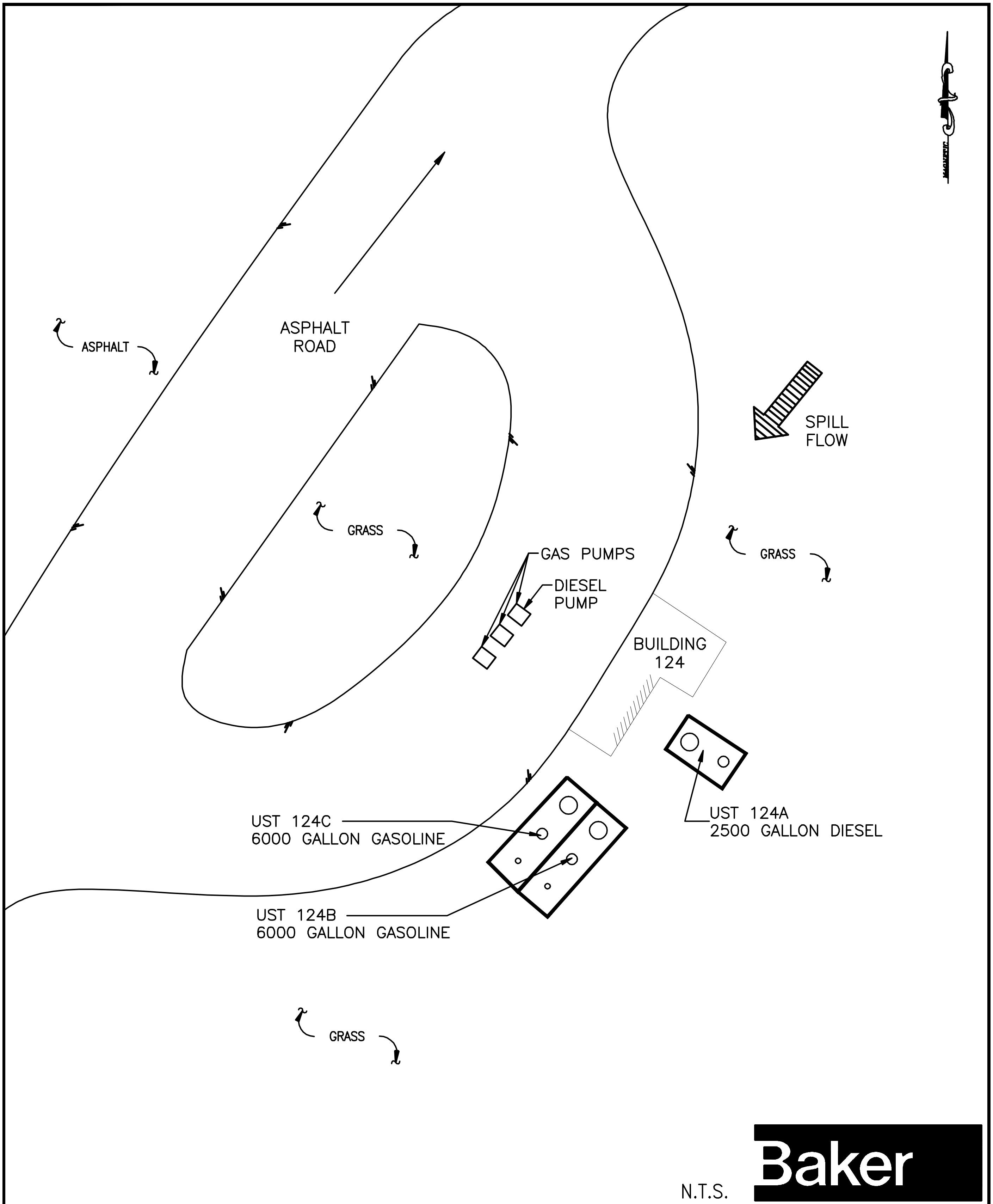
BMP Recommendations

Provide Spill Kit for Loading/Unloading operations.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Electronic	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	2010
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	2011
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	Unknown	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	2011	STI Internal Inspection:	N/A
Last Containment Sump Test:	Unknown	STI External Inspection:	N/A
Next Containment Sump Test:	2011	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



Baker

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title: STORAGE TANK SITE
LOCATION PLAN FOR
UST's 124A, 124B & 124C

USTs 124A & B

UST 124C

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	1691
Grid:	7D
Installation Year:	1994
Tank Type:	AST
Location:	Capehart WWTP
Capacity:	1000
Facility Organization:	Unknown (BOSC)
Contents:	Diesel
Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation
Nearest Building:	1691

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Fair
Tank Color:	Aggregate Finish
Construction Material:	Concrete/Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 5'8" x 4'4"
Tank Manufacturer:	ConVault
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visual Gauge, High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	Inadequate
Liquid Level Gauge Type:	Visual Gauge/Automatic Tank Gauge
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Krueger Pop-Up, Warrick Controls
HLA Manufacturer:	Warrick Controls
Gauge Model:	DMS-572
HLA Model:	DMS-572
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Warrick Controls
Next Gauge Calibration:	2011
Tank LD Manfuacturer:	Warrick Controls
Pump Starter Control:	Inaccessible to Unauthorized Personnel
Tank LD Model:	DMS-572
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	SW Copper
Pipe Condition:	Good
Pipe Length:	35'
Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	3/4"
Pipe Sumps:	N/A
Piping Leak Detection:	None
Return Pipe Diameter:	3/4"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 1691

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southwest
Initital Receptor:	Ground at Tank
Intitial Conveyance:	Sheet Flow
Probablity of Reaching Water:	Very High
Spill Equipment:	None
Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	

BMP Recommendations

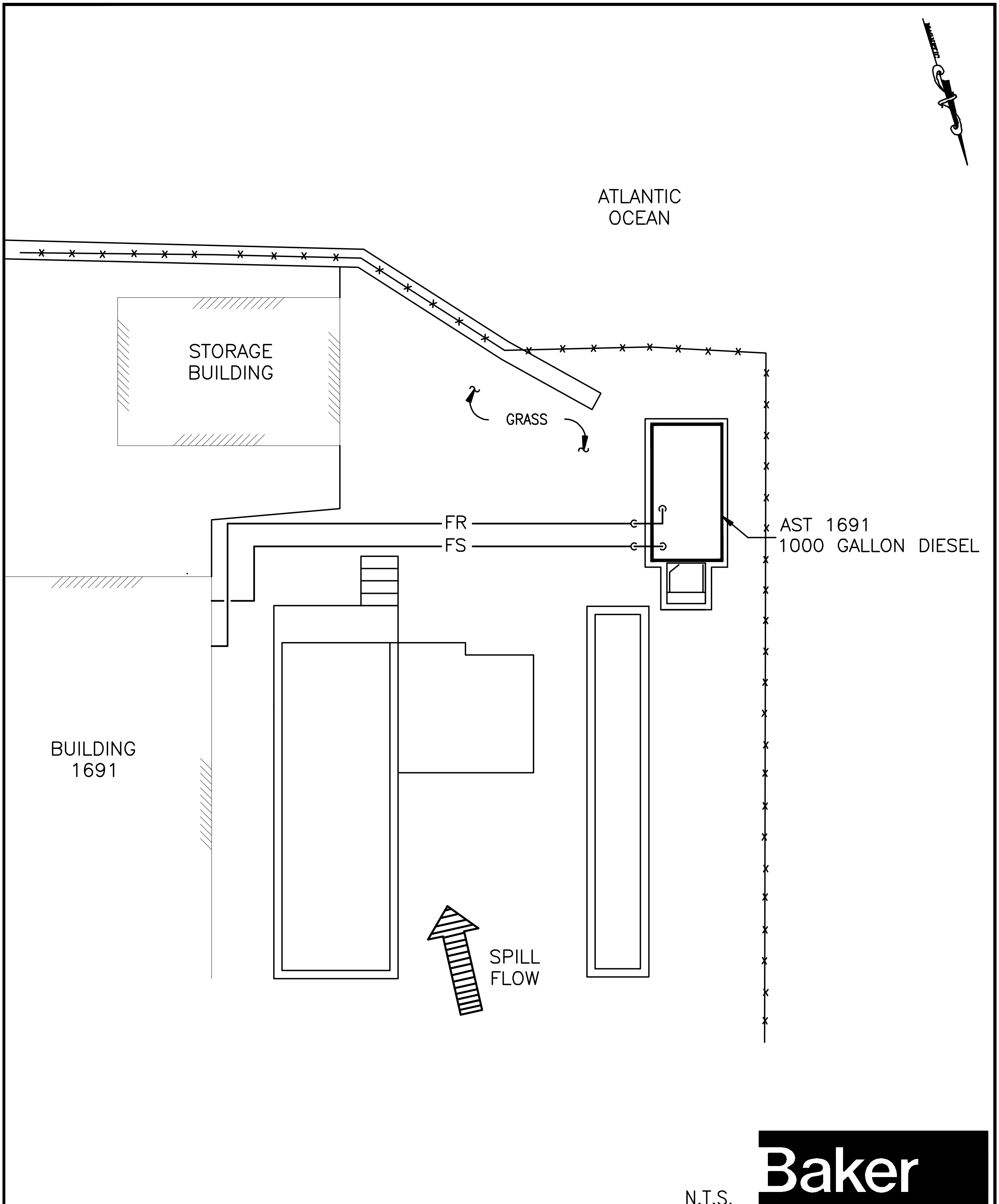
Operations and maintenance on leak detection system

Notes:

Some cracks in exterior concrete shell on top of tank.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly
Monthly Leak Detection Monitoring:	Visual Inspection
CP Bimonthly System Check:	N/A
Last Cathodic Protection Test:	N/A
Next Cathodic Protection Test:	N/A
Last Spill Bucket Test:	N/A
Next Spill Bucket Test:	N/A
Last Containment Sump Test:	N/A
Next Containment Sump Test:	N/A
Last Formal External API 653:	N/A
Next Formal External API 653:	N/A
Last Formal Piping Inspection:	N/A
Next Formal Piping Inspection:	N/A
STI Inspection Category:	N/A
STI Inspection Schedule:	N/A
STI Internal Inspection:	N/A
STI External Inspection:	N/A
Last STI Inspection:	N/A
Next STI Inspection:	N/A



Baker

LEGEND:

— FS — - Fuel Supply
— US — - Underground Secondary
—x—x— - Fence

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title: STORAGE TANK SITE
LOCATION PLAN FOR
AST 1691

AST 1691

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	1758	Grid:	6H
		Installation Year:	1970
Tank Type:	AST	Location:	Forrestal WWTP
Capacity:	500	Facility Organization:	Unknown (BOSC)
Contents:	Diesel	Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation	Nearest Building:	2019

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Good
		Tank Color:	Yellow
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Paint/Under Roof
Tank Dimension:	64"x 42"	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-level Alarm	Area Lighting:	None
		Collision Barrier:	Adequate
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Pneumecator	HLA Manufacturer:	Pneumecator
Gauge Model:	LC-1000	HLA Model:	LC-1000
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	N/A
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	12'
Pipe Corrosion Protection:	Paint		
Supply Pipe Diameter:	1"	Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	1"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	12' x 7' x 1.5'
Drain Mechanism:	Pump Out	Containment Volume:	919
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 1758

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	West	Probablity of Reaching Water:	Low
Initital Receptor:	Secondary Containment in Building	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	500		

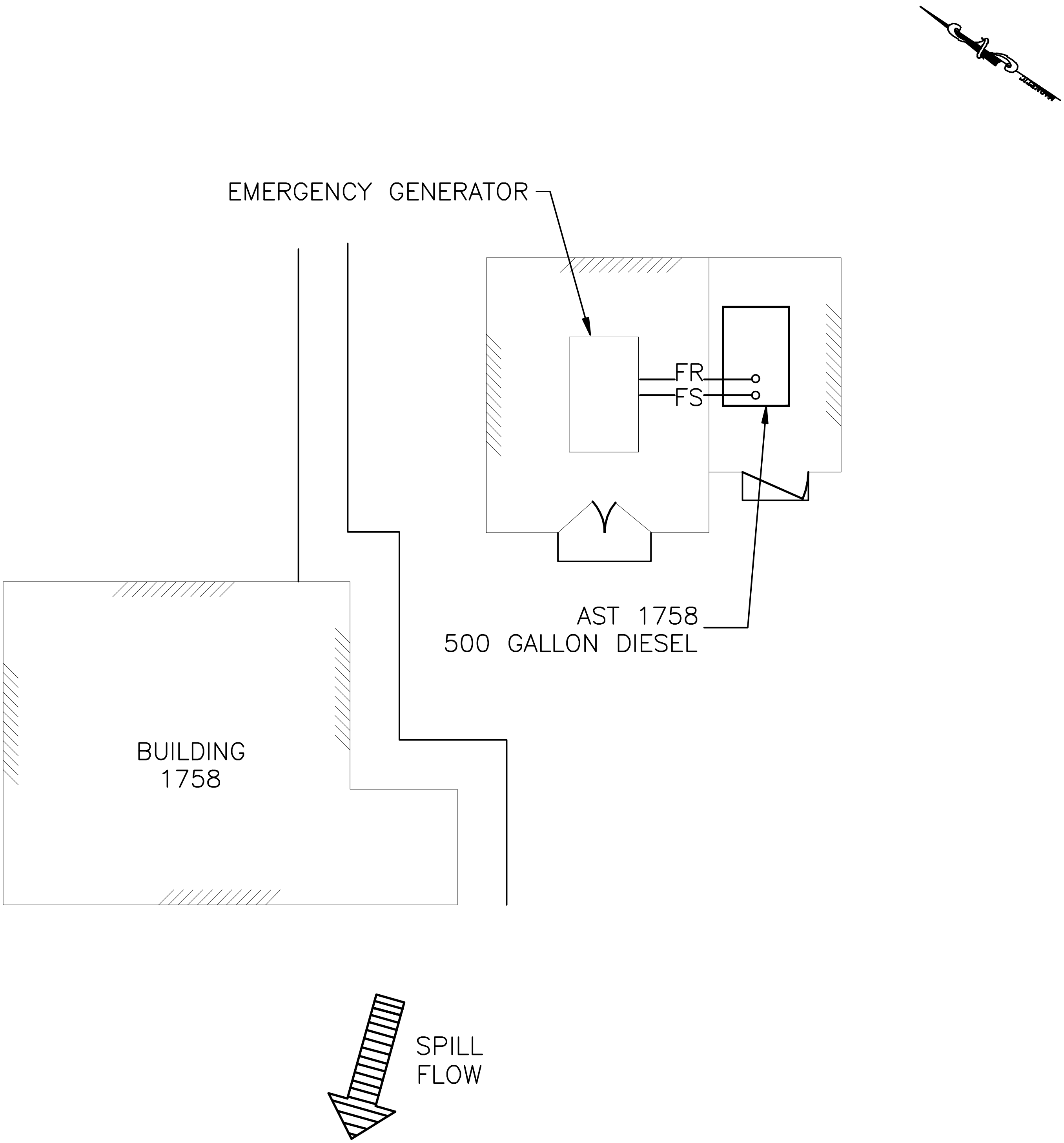
BMP Recommendations

Install overfill protection inside.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	1
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	Periodic/External
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	Unknown	STI External Inspection:	20 Years
Next Containment Sump Test:	2011	Last STI Inspection:	Unknown
		Next STI Inspection:	2011



N.T.S.

Baker

LEGEND:

— FS — - Fuel Supply

— US — - Underground Secondary

Project:

SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date:

December 2010

Title:

STORAGE TANK SITE
LOCATION PLAN FOR
AST 1758

AST 1758

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	1817 A	Grid:	6D
Installation Year:	1997		
Tank Type:	AST	Location:	NAVCOMTELSTA
Capacity:	5000	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Emergency Power Generation	Nearest Building:	1817

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	White		
Construction Material:	Concrete/Steel	Tank Manifolded:	Yes
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	13' x 12' x 7'	Tank Manufacturer:	Hoover
Lining:	None	Model Number:	LDP5000

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Inadequate		
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Krueger	HLA Manufacturer:	Veeder-Root
Gauge Model:	Unknown	HLA Model:	TLS-350
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Veeder-Root
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	Veeder-Root
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	TLS-350
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	Unknown
Pipe Corrosion Protection:	Paint		
Supply Pipe Diameter:	1"	Pipe Sumps:	
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	1"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 1817 A

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South
Probablity of Reaching Water:	Low
Initital Receptor:	Ground at Tank
Spill Equipment:	None
Intitial Conveyance:	Drainage Ditch
Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	5000

BMP Recommendations

Repair/replace visual gauges. Operations and maintenance on leak detection system.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly
Monthly Leak Detection Monitoring:	Visual Inspection/Electronic
CP Bimonthly System Check:	N/A
Last Cathodic Protection Test:	N/A
Next Cathodic Protection Test:	N/A
Last Spill Bucket Test:	N/A
Next Spill Bucket Test:	N/A
Last Containment Sump Test:	N/A
Next Containment Sump Test:	N/A
Last Formal External API 653:	N/A
Next Formal External API 653:	N/A
Last Formal Piping Inspection:	Unknown
Next Formal Piping Inspection:	2011
STI Inspection Category:	N/A
STI Inspection Schedule:	N/A
STI Internal Inspection:	N/A
STI External Inspection:	N/A
Last STI Inspection:	N/A
Next STI Inspection:	N/A

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	1817 B
Grid:	6D
Installation Year:	1997
Tank Type:	AST
Location:	NAVCOMTELSTA
Capacity:	5000
Facility Organization:	Unknown
Contents:	Diesel
Facility:	Unknown
Current Use:	Emergency Power Generation
Nearest Building:	1817

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	No
Contents Label:	No
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	White
Construction Material:	Concrete/Steel
Tank Manifolded:	Yes
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	13' x 12' x 7'
Tank Manufacturer:	Hoover
Lining:	None
Model Number:	LDP5000

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	Inadequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Krueger
HLA Manufacturer:	Veeder-Root
Gauge Model:	Unknown
HLA Model:	TLM-350
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Veeder-Root
Next Gauge Calibration:	2011
Tank LD Manfuacturer:	Veeder-Root
Pump Starter Control:	Inaccessible to Unauthorized Personnel
Tank LD Model:	TLM-350
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	SW Steel
Pipe Condition:	Good
Pipe Length:	Unknown
Pipe Corrosion Protection:	Paint
Supply Pipe Diameter:	1"
Pipe Sumps:	
Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	1"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 1817 B

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Low
Initital Receptor:	Ground at Tank	Spill Equipment:	None
Intitial Conveyance:	Drainage Ditch	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	5000		

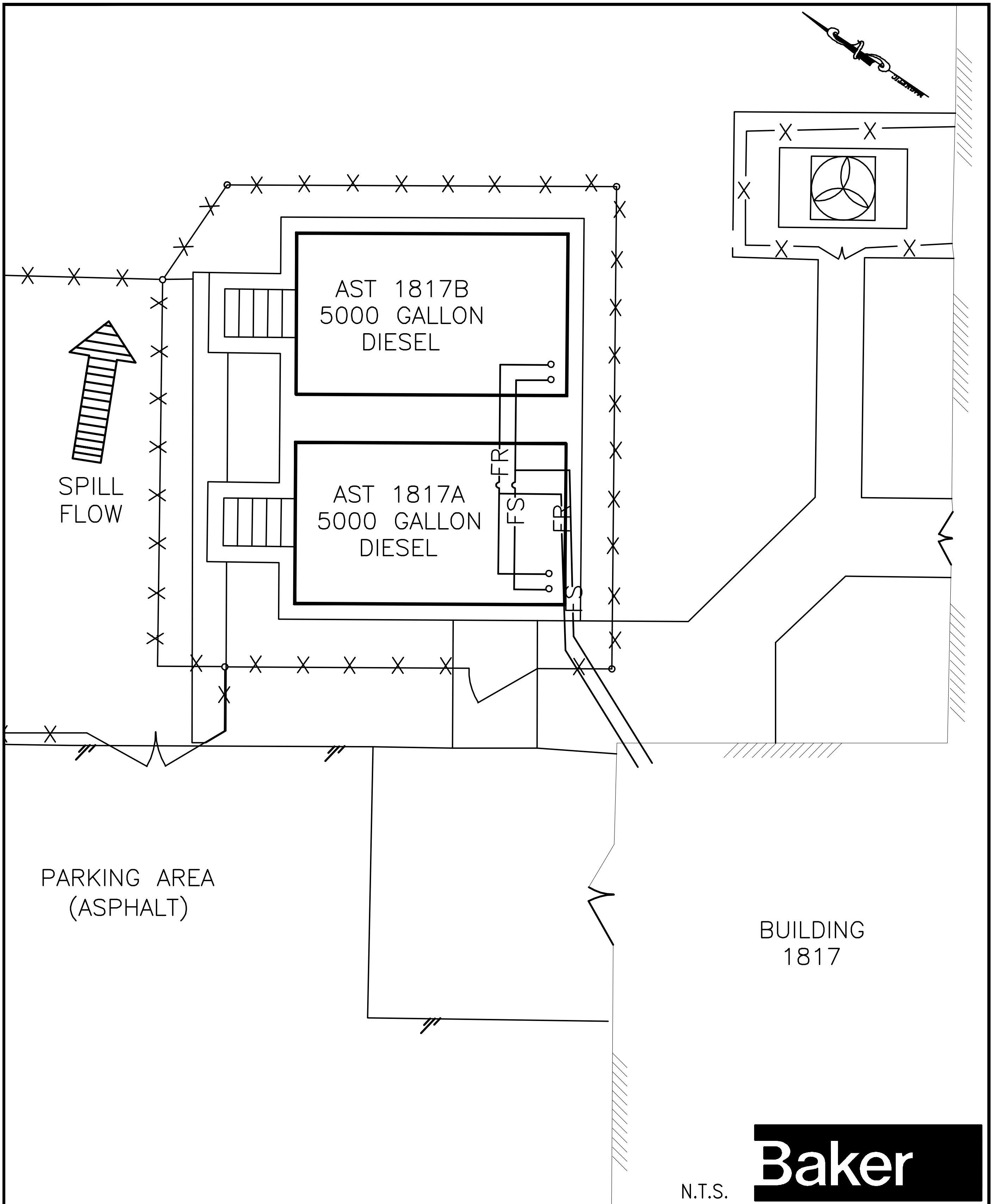
BMP Recommendations

Repair/replace visual gauges. Operations and maintenance on leak detection system.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection/Electronic	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	Unknown
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	2011
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



Baker

LEGEND:

— FS — - Fuel Supply
— FR — - Fuel Return
—x—x— - Fence

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title: **STORAGE TANK SITE LOCATION PLAN FOR AST's 1817A & 1817B**

ASTs 1817 A & B

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	1920	Grid:	6E
Installation Year:	1999		
Tank Type:	AST	Location:	Lift Station near high School
Capacity:	500	Facility Organization:	Unknown (BOSC)
Contents:	Diesel	Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation	Nearest Building:	1920

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	Aggregate Finish		
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 4.5' x 3'4"	Tank Manufacturer:	ConVault
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Krueger	HLA Manufacturer:	Warrick Controls
Gauge Model:	Unknown	HLA Model:	DMS-572
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Warrick Controls
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	Warrick Controls
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	DMS-572
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Copper
Pipe Condition:	Good	Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material/Painted		
Supply Pipe Diameter:	3/4"	Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	3/4"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 1920

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	West	Probablity of Reaching Water:	Low
Initital Receptor:	Mangrove adjacent to site	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	500		

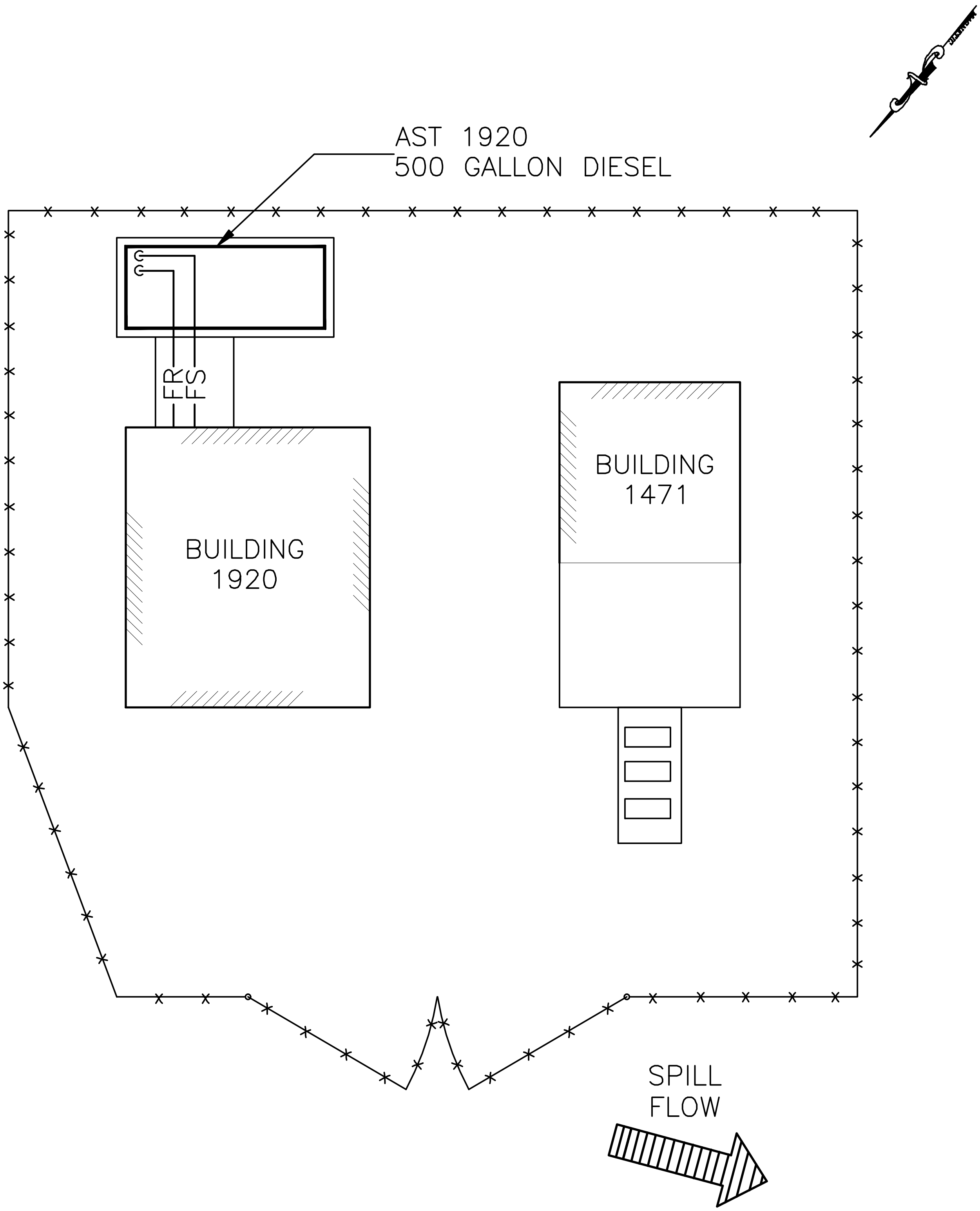
BMP Recommendations

Repair/Replace visual gauges. Operations and maintenance on leak detection system

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection/Electronic	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



N.T.S.

Baker

LEGEND:

— FS — - Fuel Supply
— FR — - Fuel Return
—x—x— - Fence

Project: **SPCC PLAN**
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: **December 2010**

Title:

STORAGE TANK SITE
LOCATION PLAN FOR
AST 1920

AST 1920

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	1971-INT
Grid:	5E
Installation Year:	Unknown
Tank Type:	AST-INT
Location:	Lift Station
Capacity:	260
Facility Organization:	Unknown (BOSC)
Contents:	Diesel
Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation
Nearest Building:	1971

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	No
Contents Label:	No
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Good
Tank Color:	Grey
Construction Material:	Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Paint/Under Roof
Tank Dimension:	100" x 30" x 20"
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	None
Gauge Manufacturer:	Krueger
HLA Manufacturer:	N/A
Gauge Model:	Type D
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	2011
Tank LD Manfuacturer:	N/A
Pump Starter Control:	At generator
Tank LD Model:	N/A
Valves Surface Security:	Yes
Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	N/A
Pipe Construction Material:	Rubber
Pipe Condition:	Good
Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	3/8"
Pipe Sumps:	None
Piping Leak Detection:	Visual Inspection
Return Pipe Diameter:	3/8"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block
Containment Dimensions	144" x 144" x 10"
Drain Mechanism:	Pump Out
Containment Volume:	900
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 1971-INT

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

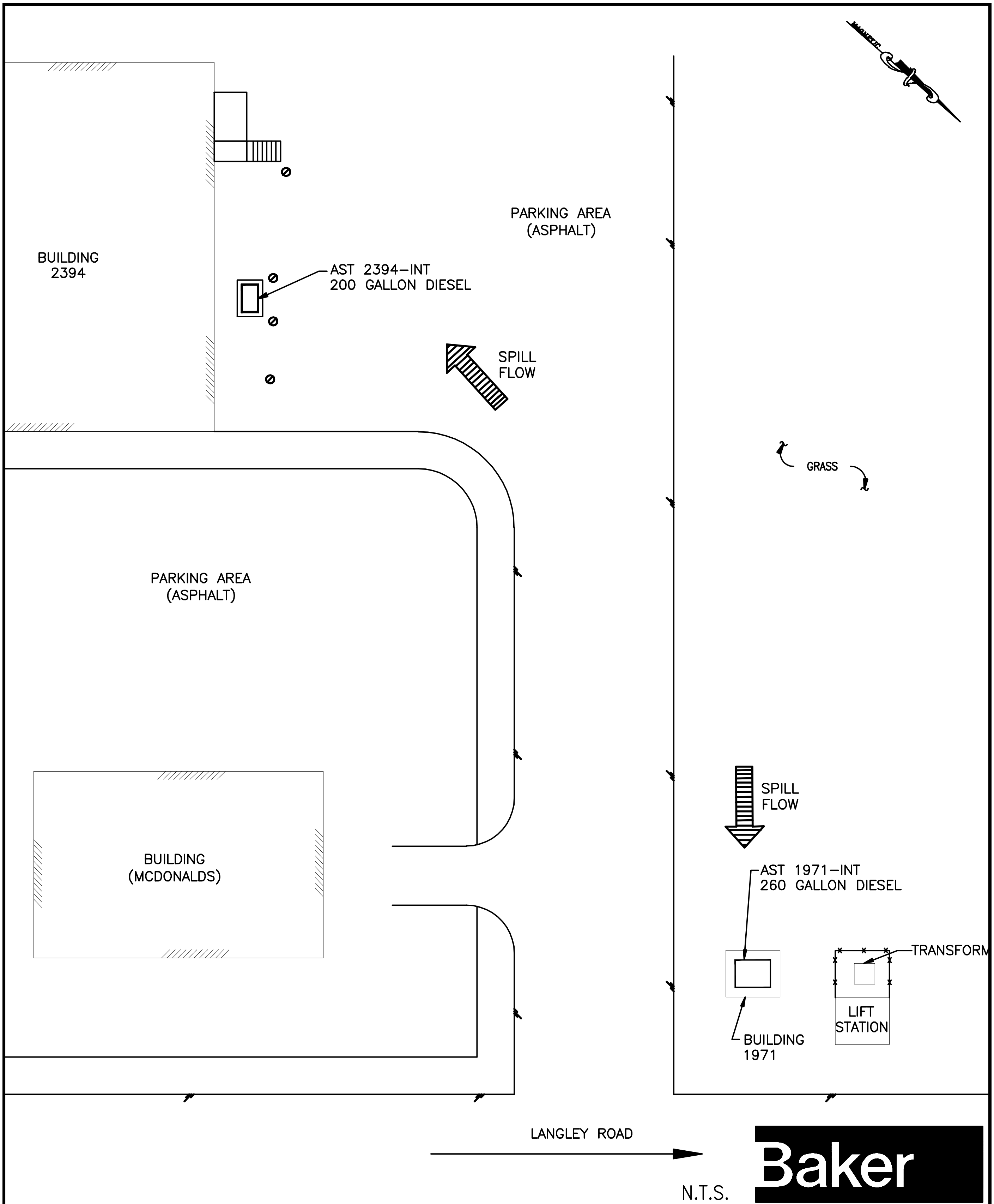
Initial Spill Direction	South
Initital Receptor:	Concrete Containment Inside Building
Intitial Conveyance:	Sheet Flow
Probablity of Reaching Water:	Low
Spill Equipment:	None
Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	260

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly
Monthly Leak Detection Monitoring:	Visual Inspection
CP Bimonthly System Check:	N/A
Last Cathodic Protection Test:	N/A
Next Cathodic Protection Test:	N/A
Last Spill Bucket Test:	N/A
Next Spill Bucket Test:	N/A
Last Containment Sump Test:	Unknown
Next Containment Sump Test:	2011
Last Formal External API 653:	N/A
Next Formal External API 653:	N/A
Last Formal Piping Inspection:	N/A
Next Formal Piping Inspection:	N/A
STI Inspection Category:	1
STI Inspection Schedule:	Periodic
STI Internal Inspection:	N/A
STI External Inspection:	N/A
Last STI Inspection:	Unknown
Next STI Inspection:	2011



LEGEND:

—x—x— - Fence

⊘ - Bollards

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title:

STORAGE TANK SITE LOCATION PLAN FOR AST's 2394-INT & 1971-INT

AST 1971-INT

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	2017	Grid:	6C
		Installation Year:	2004
Tank Type:	AST	Location:	End of Bairoko Street
Capacity:	500	Facility Organization:	Unknown (BOSC)
Contents:	Diesel	Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation	Nearest Building:	2017

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
		Tank Color:	Aggregate Finish
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Painted
Tank Dimension:	11' x 4.5' x 3'4"	Tank Manufacturer:	ConVault
Lining:	None	Model Number:	Core

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge	Area Lighting:	None
		Collision Barrier:	Inadequate
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	None
Gauge Manufacturer:	Krueger	HLA Manufacturer:	N/A
Gauge Model:	Unknown	HLA Model:	N/A
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Pop-up Display
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	Krueger
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Poor	Pipe Length:	22'
		Pipe Corrosion Protection:	None
Supply Pipe Diameter:	3/4"	Pipe Sumps:	N/A
		Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	3/4"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 2017

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	West	Probablity of Reaching Water:	Low
Initital Receptor:	Mangroves Adjacent to Site	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	500		

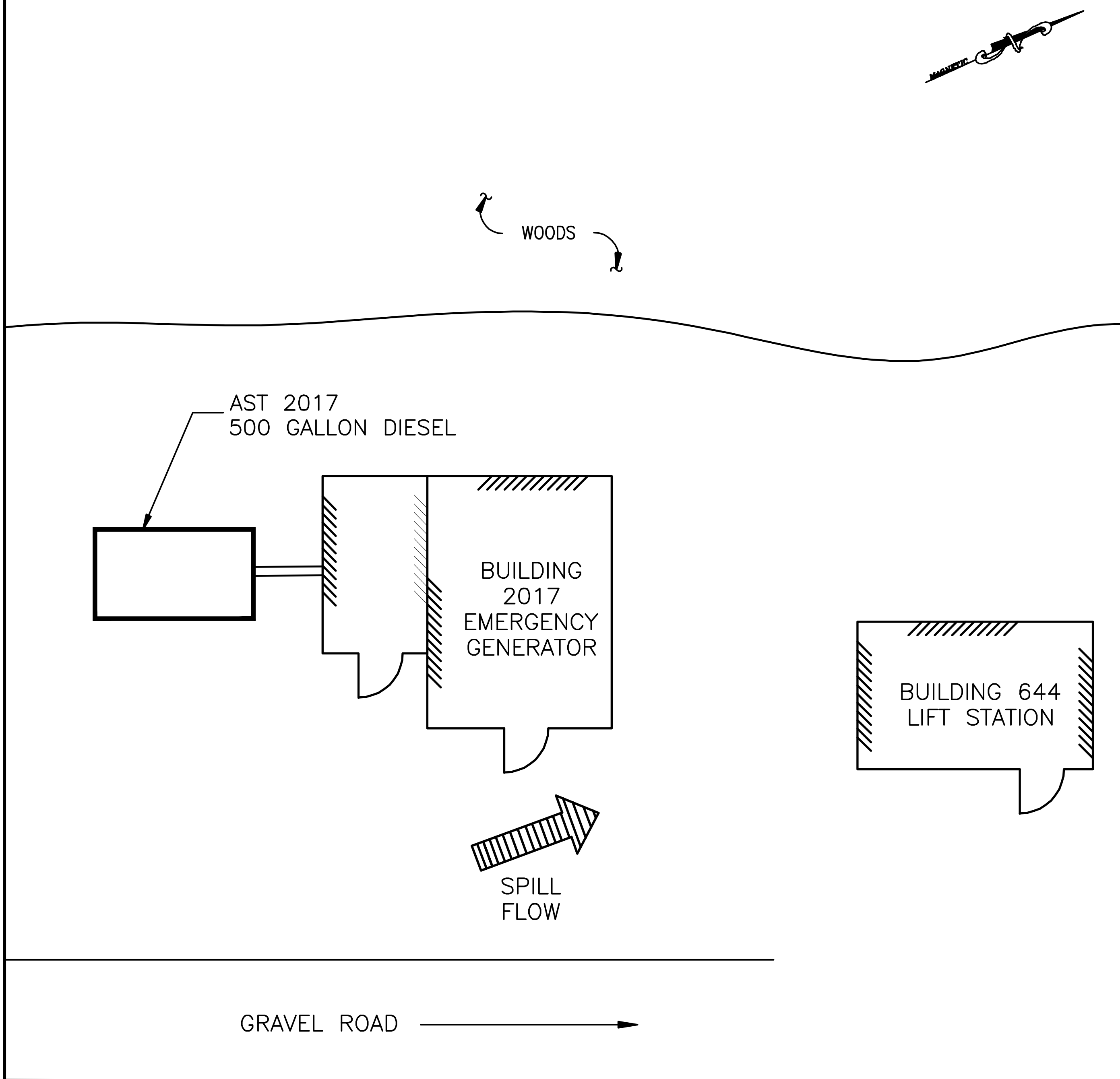
BMP Recommendations

Repair and repaint piping for corrosion protection or replace with a corrosion resistant material. Repair/Replace interstitial monitoring gauge.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



N.T.S.

Baker

	Project: SPCC PLAN NAVAL ACTIVITIY PUERTO RICO CEIBA, PUERTO RICO	Title: STORAGE TANK SITE LOCATION PLAN FOR AST 2017
	Date: December 2010	

AST 2017

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	2020	Grid:	4F
Installation Year:	2004		
Tank Type:	AST	Location:	Lift Station near FD
Capacity:	500	Facility Organization:	Unknown (BOSC)
Contents:	Diesel	Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation	Nearest Building:	2020

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	Aggregate Finish		
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 4.5' x 3'4"	Tank Manufacturer:	ConVault
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge	Area Lighting:	Adequate
Collision Barrier:	Inadequate		
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	None
Gauge Manufacturer:	Krueger	HLA Manufacturer:	N/A
Gauge Model:	Unknown	HLA Model:	N/A
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Visual Inspection Pop-up Gauge
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	Krueger
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Poor	Pipe Length:	28'
Pipe Corrosion Protection:	None		
Supply Pipe Diameter:	3/4"	Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	3/4"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 2020

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Low
Initital Receptor:	Ground at Tank	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	500		

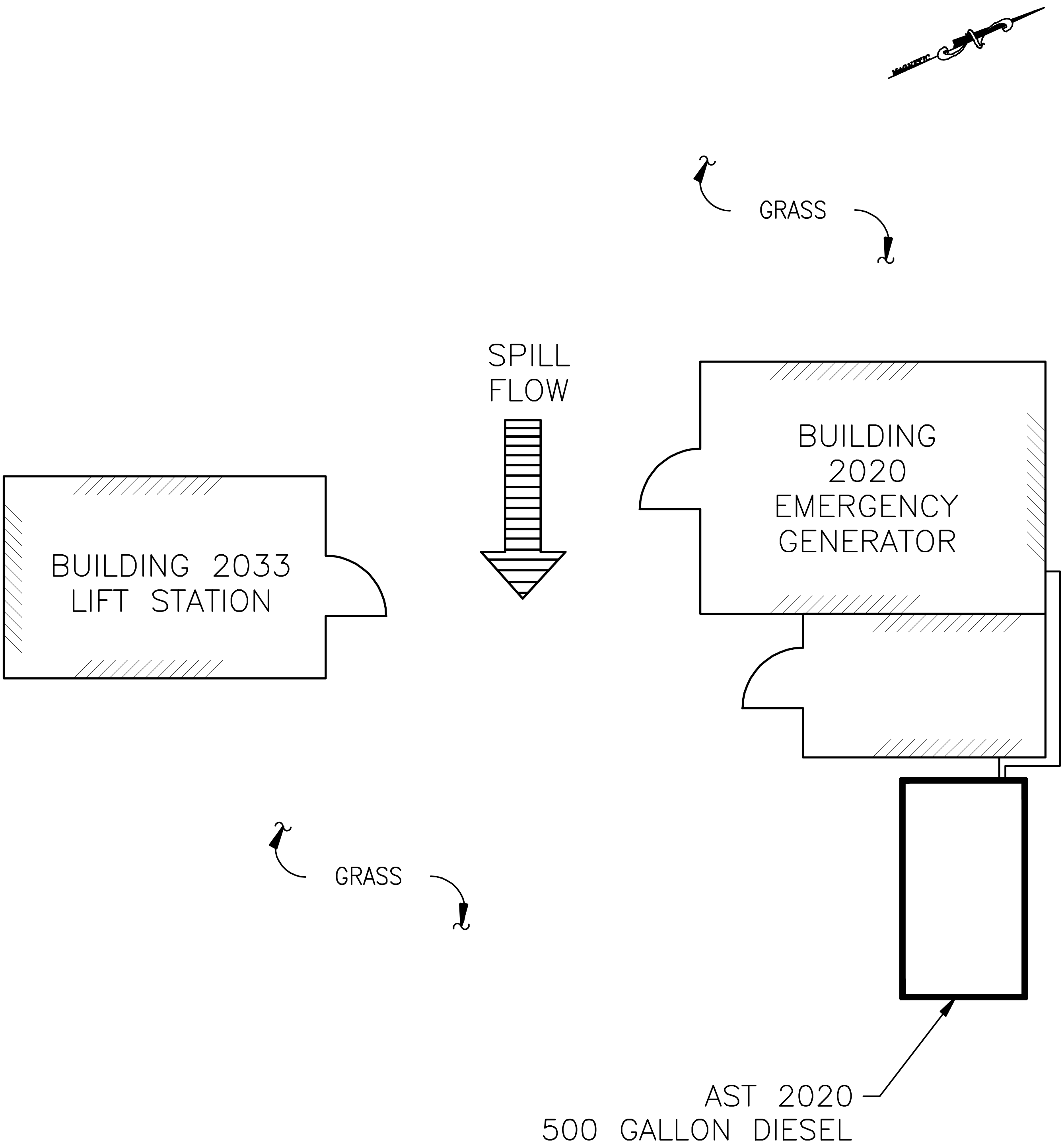
BMP Recommendations

Repair and repaint piping for corrosion protection or replace with a corrosion resistant material. Repair/Replace main tank and interstitial monitoring gauge.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



N.T.S.

Baker

	Project: SPCC PLAN NAVAL ACTIVITIY PUERTO RICO CEIBA, PUERTO RICO	Title: STORAGE TANK SITE LOCATION PLAN FOR AST 2020
	Date: December 2010	

AST 2020

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID: 2021
Grid: 7C
Installation Year: 1982
Tank Type: AST
Location: Bundy WWTP
Capacity: 500
Facility Organization: Unknown (BOSC)
Contents: Diesel
Facility: Unknown (BOSC)
Current Use: Emergency Power Generation
Nearest Building: 2021

LABELING AND CODING

Tank ID Label: No
Capacity Label: No
Contents Label: Yes
Fill Port Color Coded: No

TANK INFORMATION

Construction Type: SW
Tank Condition: Good
Tank Color: Yellow
Construction Material: Steel
Tank Manifolded: No
Tank Shape: Horizontal Cylinder
Corrosion Protection: Paint/Under Roof
Tank Dimension: 64"x 42"
Tank Manufacturer: Unknown
Lining: None
Model Number: Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection: Visible Gauge/High-Level Alarm
Area Lighting: Inadequate
Collision Barrier: Adequate
Liquid Level Gauge Type: Pop-up Display
HLA Type: Audible (Electronic)
Gauge Manufacturer: Sentry
HLA Manufacturer: Pnuemecator
Gauge Model: Unknown
HLA Model: LC 1000
Last Gauge Calibration: Unknown
Tank Leak Detection: Visual Inspection
Next Gauge Calibration: 2011
Tank LD Manfuacturer: N/A
Pump Starter Control: Inaccessible to Unauthorized Personnel
Tank LD Model: N/A
Valves Surface Security: Yes
Spill Catchment: None

PIPING SYSTEM

Piping Exposure: Aboveground
Pipe Construction Material: SW Steel
Pipe Condition: Good
Pipe Length: 12"
Pipe Corrosion Protection: Paint
Supply Pipe Diameter: 1"
Pipe Sumps: N/A
Piping Leak Detection: Visible Inspection
Return Pipe Diameter: 1"
Pressurized Piping Line Leak Detectors: N/A
Delivery System: Suction
Annual Line Leak Detectors Testing: Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment: Concrete/Block
Containment Dimensions: 9' x 6.5' x 1.5'
Drain Mechanism: Pump Out
Containment Volume: 656
Drainage Outfall: None
Drain Security: N/A
Loading/UnLoading Containment: Spill Kit
Loading/Unloading Containment Recommendations:

Continuation of Tank ID: 2021

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

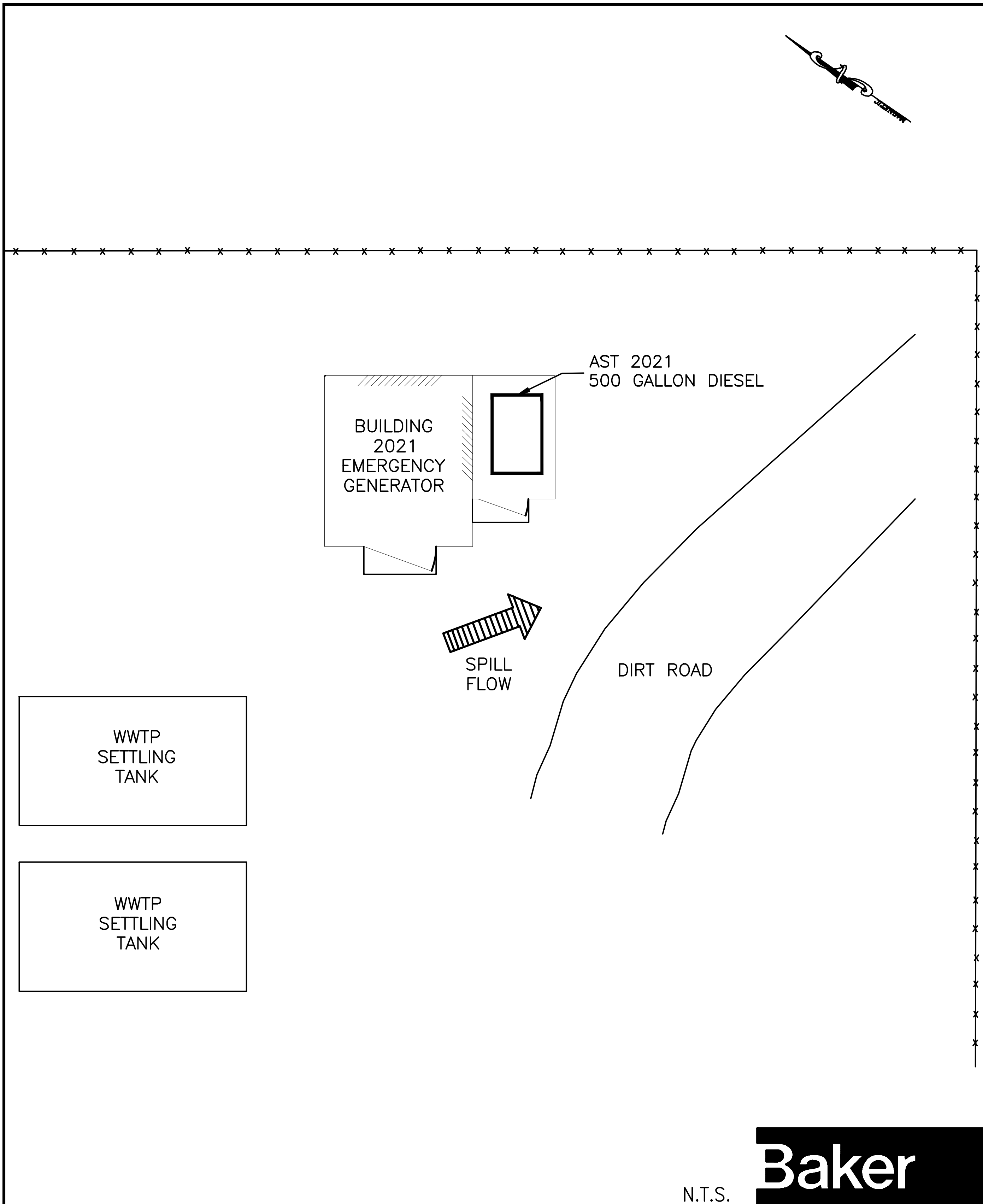
Initial Spill Direction	Southeast	Probablity of Reaching Water:	Low
Initital Receptor:	Containment Inside Building	Spill Equipment:	Spill Kit
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	500		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	1
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	Periodic/External
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	Unknown	STI External Inspection:	20 Years
Next Containment Sump Test:	2011	Last STI Inspection:	Unknown
		Next STI Inspection:	2011



LEGEND:

— FS — - Fuel Supply
— FR — - Fuel Return
—x—x— - Fence

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title: STORAGE TANK SITE
LOCATION PLAN FOR
AST 2021

AST 2021

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	2231-INT
Grid:	5F
Installation Year:	Unknown
Tank Type:	AST-INT
Location:	Lift Station 39
Capacity:	300
Facility Organization:	Unknown (BOSC)
Contents:	Diesel
Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation
Nearest Building:	2231

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	No
Contents Label:	No
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Good
Tank Color:	Grey
Construction Material:	Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Paint/Under Roof
Tank Dimension:	112" x 30" x 20"
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	None
Gauge Manufacturer:	Krueger
HLA Manufacturer:	N/A
Gauge Model:	Type D
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	2011
Tank LD Manfuacturer:	N/A
Pump Starter Control:	At generator
Tank LD Model:	N/A
Valves Surface Security:	Yes
Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	Rubber
Pipe Condition:	Good
Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	1/2"
Pipe Sumps:	None
Piping Leak Detection:	Visual Inspection
Return Pipe Diameter:	1/2"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block
Containment Dimensions	144" x 144" x 10"
Drain Mechanism:	Pump Out
Containment Volume:	900
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 2231-INT

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

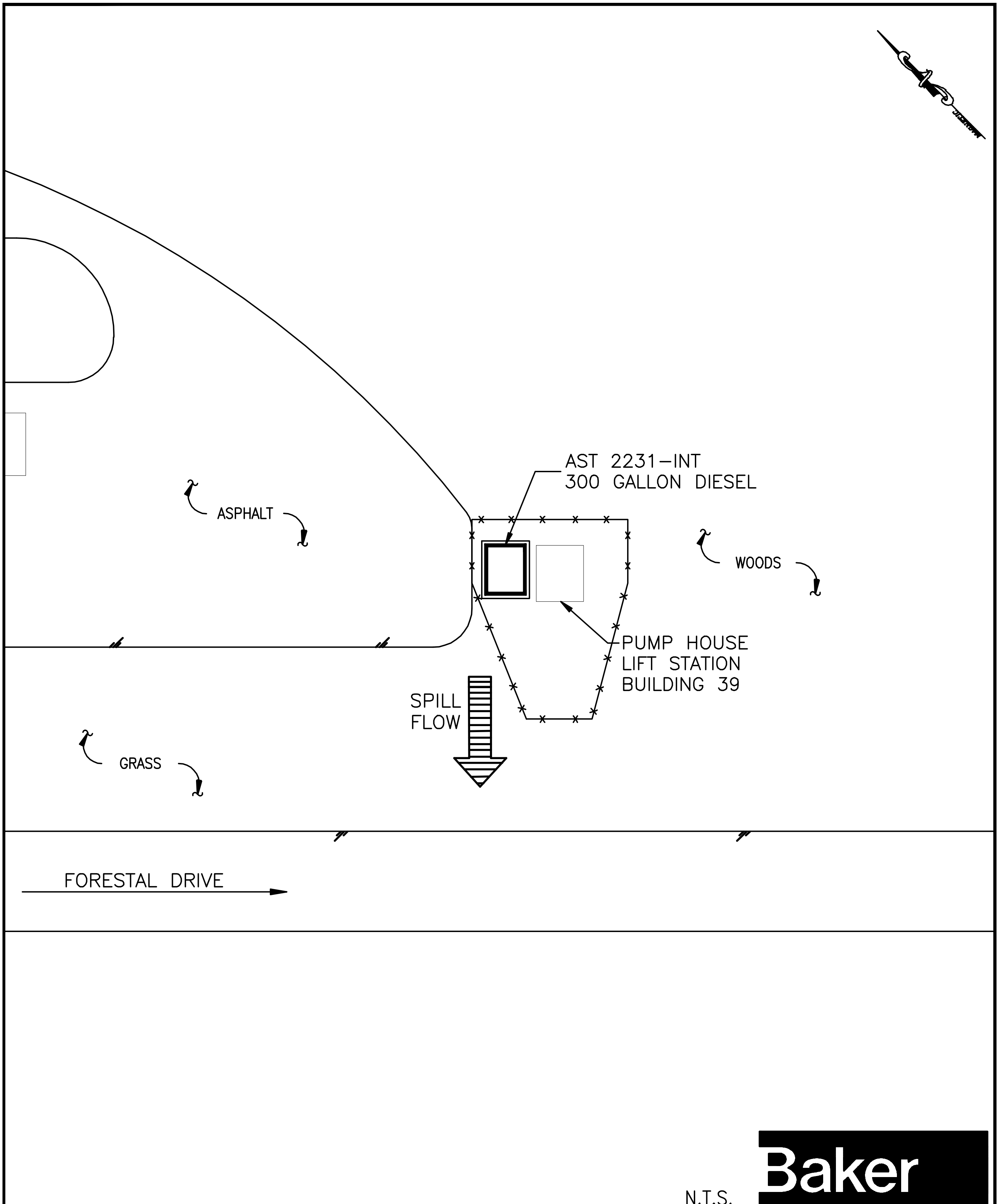
Initial Spill Direction	Southwest	Probablity of Reaching Water:	Moderate
Initital Receptor:	Concrete Containment Inside Building	Spill Equipment:	None
Intitial Conveyance:	Sheet flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	300		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	1
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	Periodic
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	Unknown	STI External Inspection:	N/A
Next Containment Sump Test:	2011	Last STI Inspection:	Unknown
		Next STI Inspection:	2011



Baker

LEGEND:	Project: SPCC PLAN NAVAL ACTIVITIY PUERTO RICO CEIBA, PUERTO RICO	Title:
—x—x— - Fence	Date: December 2010	STORAGE TANK SITE LOCATION PLAN FOR AST 2231-INT

AST 2231-INT

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	2248	Grid:	6D
Installation Year:	1989		
Tank Type:	AST	Location:	Building 2248
Capacity:	5000	Facility Organization:	Unknown (BOSC)
Contents:	Diesel	Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation	Nearest Building:	2248

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Good
Tank Color:	Yellow		
Construction Material:	Welded Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Painted
Tank Dimension:	24' x 6'	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-level Alarm	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Scully	HLA Manufacturer:	Scully
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	N/A
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	Steel
Pipe Condition:	Good	Pipe Length:	Unknown
Pipe Corrosion Protection:	None		
Supply Pipe Diameter:	1"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	1"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	27' x 8' x 4'
Drain Mechanism:	Drain Valve	Containment Volume:	5655
Drainage Outfall:	Ground outside dike	Drain Security:	No
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 2248

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southeast	Probablity of Reaching Water:	Low
Initital Receptor:	Secondary Containment	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	5000		

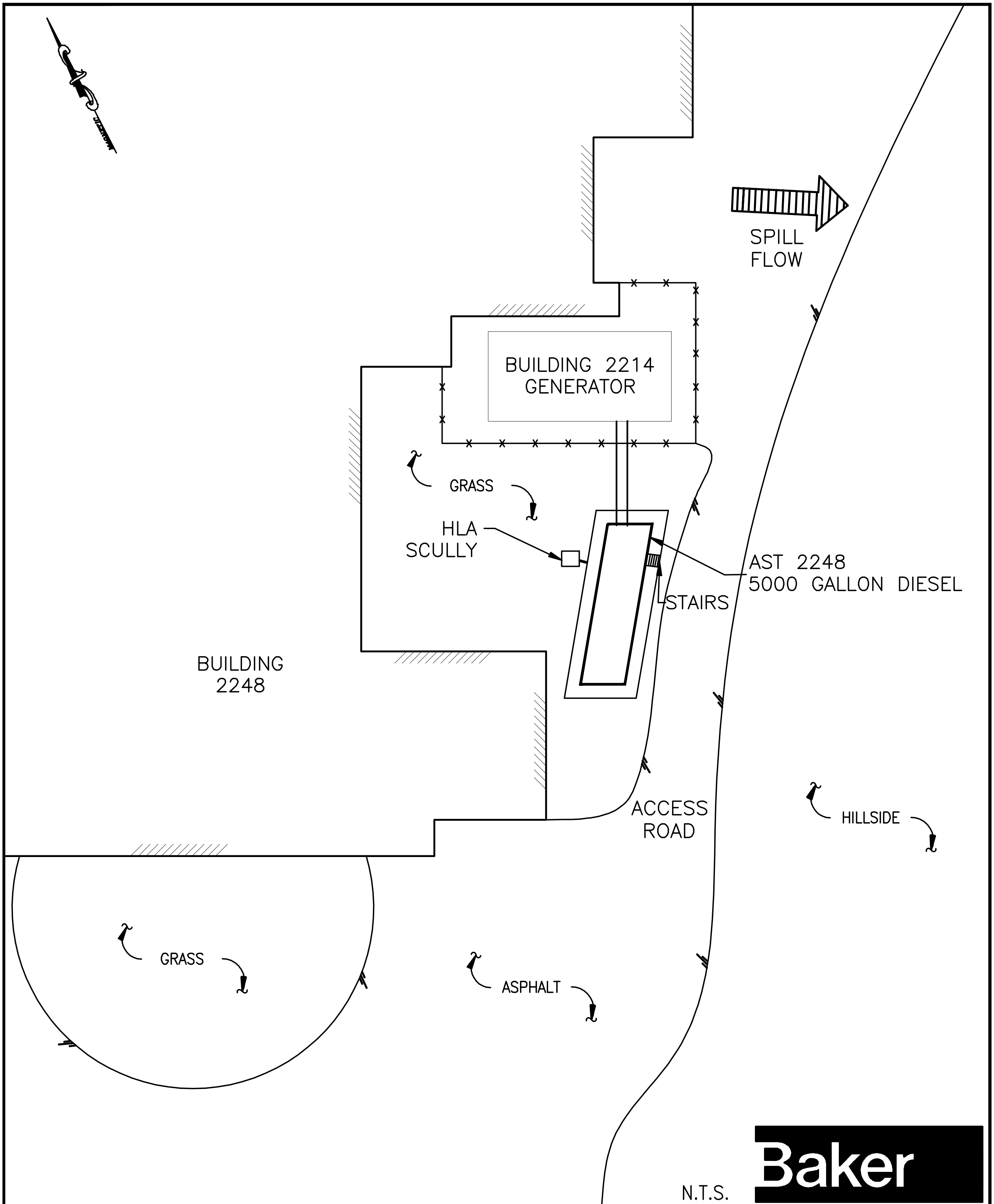
BMP Recommendations

Enlarge secondary containment dike.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	1994
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	2011
Next Cathodic Protection Test:	N/A	STI Inspection Category:	1
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	Periodic/External
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	Unknown	STI External Inspection:	20 Years
Next Containment Sump Test:	2011	Last STI Inspection:	Unknown
		Next STI Inspection:	2011



LEGEND:

—x—x— - Fence

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title: STORAGE TANK SITE
LOCATION DRAWING FOR
AST 2248

AST 2248

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	2293	Grid:	6D
		Installation Year:	Unknown
Tank Type:	UST	Location:	Building 2293
Capacity:	4000	Facility Organization:	Unknown (BOSC)
Contents:	Diesel	Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation	Nearest Building:	2293

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Unknown
		Tank Color:	Unknown
Construction Material:	FRP	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Unknown
Tank Dimension:	Unknown	Tank Manufacturer:	Unknown
Lining:	Unknown	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm	Area Lighting:	Inadequate
		Collision Barrier:	Inadequate
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Veeder-Root	HLA Manufacturer:	Veeder-Root
Gauge Model:	TLS-350	HLA Model:	TLS-350
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Veeder-Root
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	Veeder-Root
Pump Starter Control:	In Building	Tank LD Model:	TLS-350
Valves Surface Security:	Yes	Spill Catchment:	Spill Bucket

PIPING SYSTEM

Piping Exposure:	Underground			Pipe Construction Material:	Unknown
Pipe Condition:	Unknown	Pipe Length:	Unknown	Pipe Corrosion Protection:	Unknown
Supply Pipe Diameter:	Unknown	Pipe Sumps:	Unknown	Piping Leak Detection:	None
Return Pipe Diameter:	Unknown			Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction			Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 2293

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	East	Probablity of Reaching Water:	Low
Initital Receptor:	N/A	Spill Equipment:	None
Intitial Conveyance:	N/A	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	4000		

BMP Recommendations

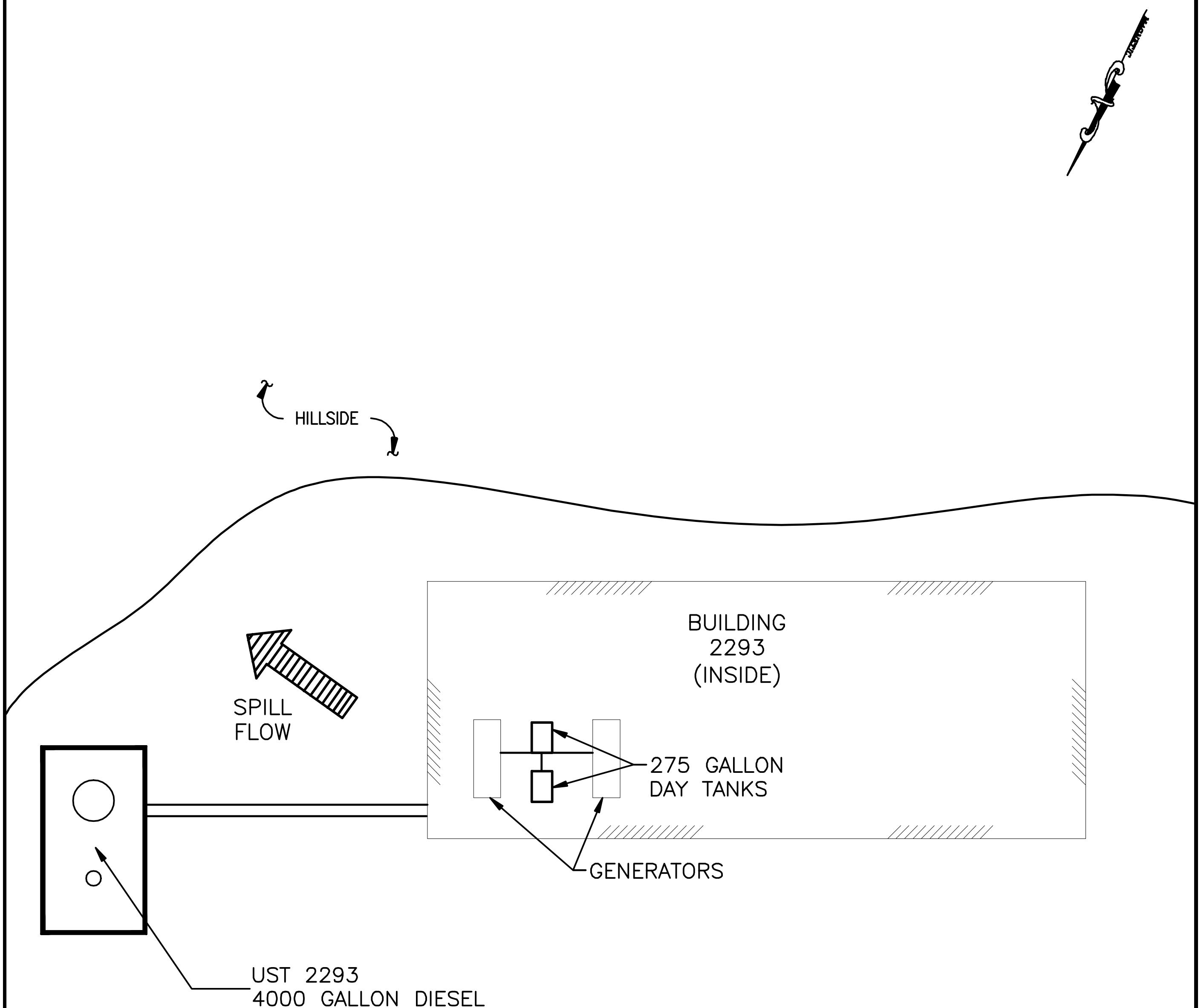
Perform tightness testing of underground pipe, since leak detection cannot be installed for pipe.

Notes:

2x 275 gallon Tramont Day tanks located within the building.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Electronic	Next Formal External API 653:	N/A
CP Bimonthly System Check:	Unknown	Last Formal Piping Inspection:	Unknown
Last Cathodic Protection Test:	Unknown	Next Formal Piping Inspection:	2011
Next Cathodic Protection Test:	Unknown	STI Inspection Category:	N/A
Last Spill Bucket Test:	Unknown	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	2011	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



N.T.S.

Baker

	Project: SPCC PLAN NAVAL ACTIVITIY PUERTO RICO CEIBA, PUERTO RICO	**Title:** STORAGE TANK SITE LOCATION PLAN FOR UST 2293
	Date: December 2010	

UST 2293

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	2303-2
Grid:	5E
Installation Year:	Unknown
Tank Type:	AST
Location:	Navy lodge
Capacity:	500
Facility Organization:	Unknown (BOSC)
Contents:	Diesel
Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation
Nearest Building:	2303

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	No
Contents Label:	Yes
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Fair
Tank Color:	Yellow
Construction Material:	Steel
Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder
Corrosion Protection:	Paint
Tank Dimension:	64"x42"
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge
Area Lighting:	Inadequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	None
Gauge Manufacturer:	Unknown
HLA Manufacturer:	N/A
Gauge Model:	Unknown
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	2011
Tank LD Manfuacturer:	N/A
Pump Starter Control:	Adequate
Tank LD Model:	N/A
Valves Surface Security:	Yes
Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	Copper
Pipe Condition:	Good
Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	1/2"
Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	1/2"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block
Containment Dimensions	102" x 66" x 36"
Drain Mechanism:	Pump Out
Containment Volume:	1050
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 2303-2

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southeast	Probablity of Reaching Water:	Low
Initital Receptor:	Secondary Containment	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	500		

BMP Recommendations

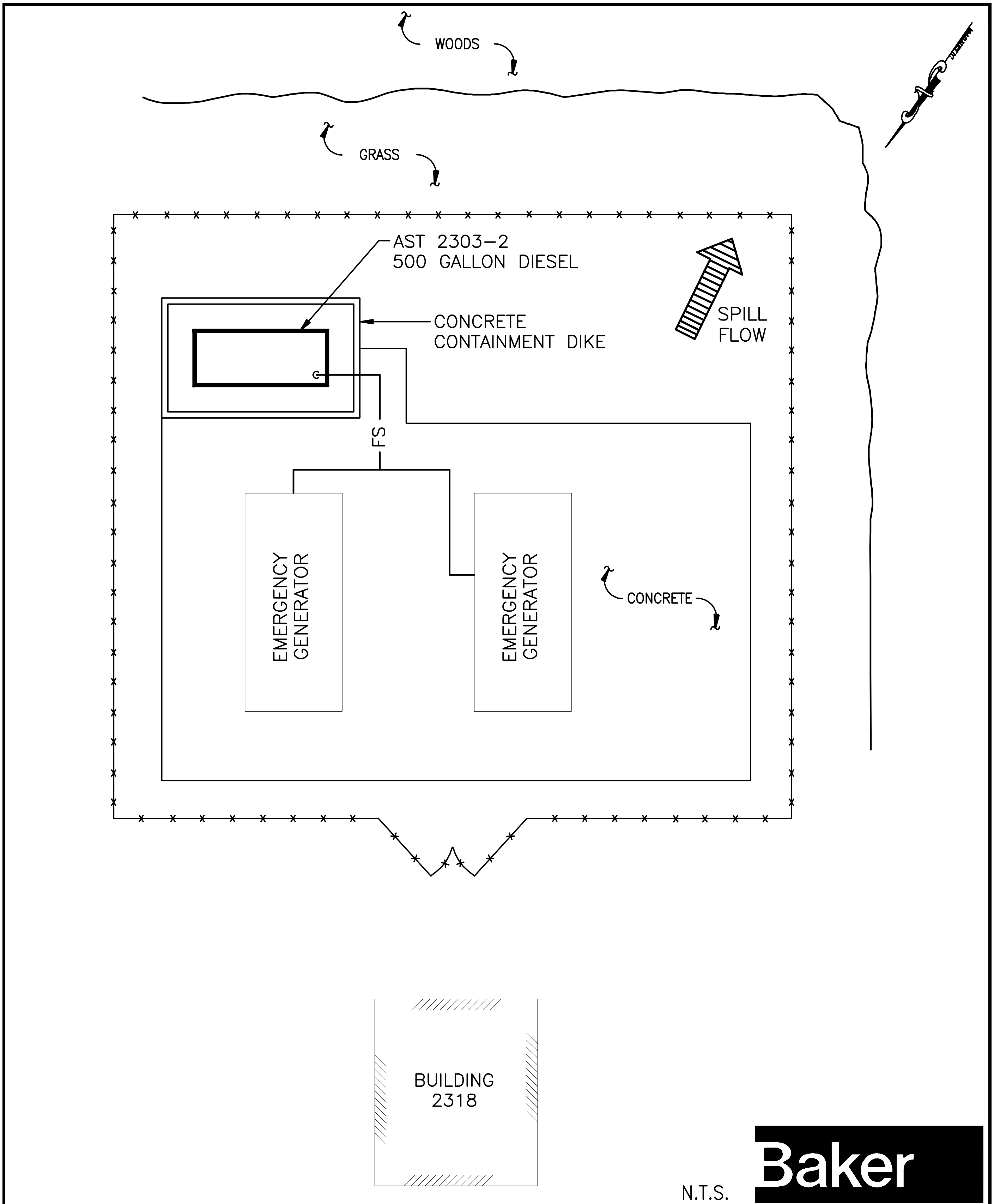
Repair tank coating., repair/replace pop-up gauge. Reroute piping so it does not compromise secondary containment and repair containment.

Notes:

1/2" lines plumbed through the secondary containment approximately 1' from the bottom, hole not sealed.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	1
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	Periodic/External
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	Unknown	STI External Inspection:	20 Years
Next Containment Sump Test:	2011	Last STI Inspection:	Unknown
		Next STI Inspection:	2011



LEGEND:

— FS — - Fuel Supply
—x—x— - Fence

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title: STORAGE TANK SITE
LOCATION PLAN FOR
AST 2303-2


DANGER
DIESEL
FUEL
NO SMOKING
NO OPEN FLAMES
NO SPARKS
Baker
AST
2303-2

AST 2303-2

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	2334-INT	Grid:	5F
Installation Year:	2009		
Tank Type:	AST-INT	Location:	Marina
Capacity:	569	Facility Organization:	Unknown (BOSC)
Contents:	Diesel	Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation	Nearest Building:	2334

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	Red		
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Paint
Tank Dimension:	110" x 44" x 26"	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Dial Gauge	HLA Type:	None
Gauge Manufacturer:	Unknown	HLA Manufacturer:	N/A
Gauge Model:	Unknown	HLA Model:	N/A
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	N/A
Pump Starter Control:	At generator	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	Rubber
Pipe Condition:	Good	Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material		
Supply Pipe Diameter:	1/2"	Pipe Sumps:	None
Piping Leak Detection:	Visual Inspection		
Return Pipe Diameter:	1/2"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	Plug	Containment Volume:	N/A
Drainage Outfall:	Bermed containment area	Drain Security:	No
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 2334-INT

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

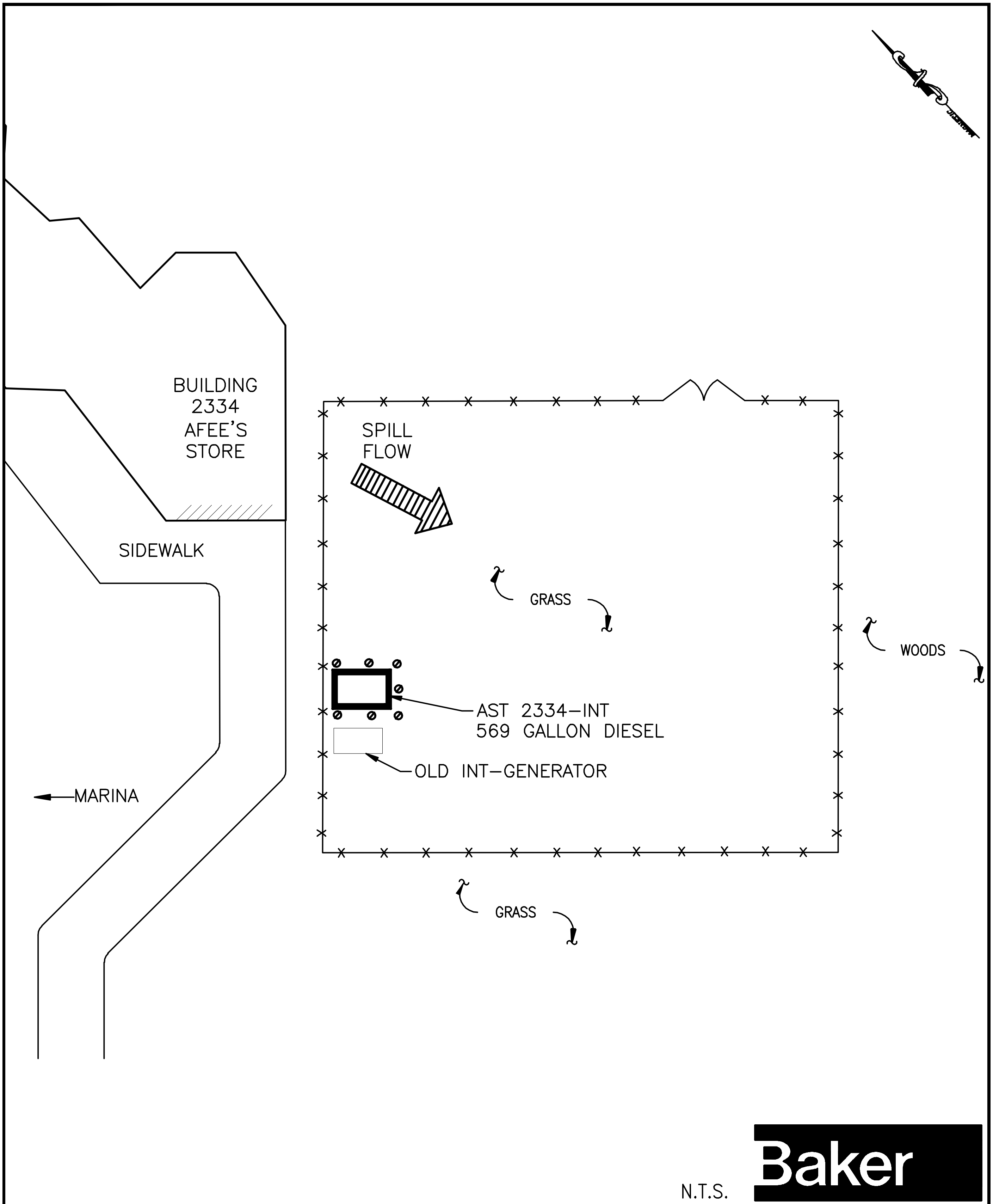
Initial Spill Direction	South	Probablity of Reaching Water:	High
Initital Receptor:	Concrete containment area	Spill Equipment:	None
Intitial Conveyance:	Sheet flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	569		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



LEGEND:

—x—x— - Fence

⊘ - Bollards

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title: STORAGE TANK SITE
LOCATION PLAN FOR
AST 2334-INT

AST 2334-INT

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	2360	Grid:	5H
Installation Year:	1999		
Tank Type:	AST	Location:	Lift station near NSWU-4
Capacity:	500	Facility Organization:	Unknown (BOSC)
Contents:	Diesel	Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation	Nearest Building:	2360

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	Aggregate Finish		
Construction Material:	Concrete/steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 4.5' x 3'4"	Tank Manufacturer:	ConVault
Lining:	N/A	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Inadequate		
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	Visible Gauge; high level alarm
Gauge Manufacturer:	Krueger	HLA Manufacturer:	Warrick Controls
Gauge Model:	Unknown	HLA Model:	DMS-572
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Warrick Controls
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	Warrick Controls
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	DMS-572
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Copper
Pipe Condition:	Good	Pipe Length:	20'
Pipe Corrosion Protection:	Corrosion Resistant Material		
Supply Pipe Diameter:	3/4"	Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	3/4"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 2360

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	West	Probablity of Reaching Water:	Low
Inititial Receptor:	Ground at Tank	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	500		

BMP Recommendations

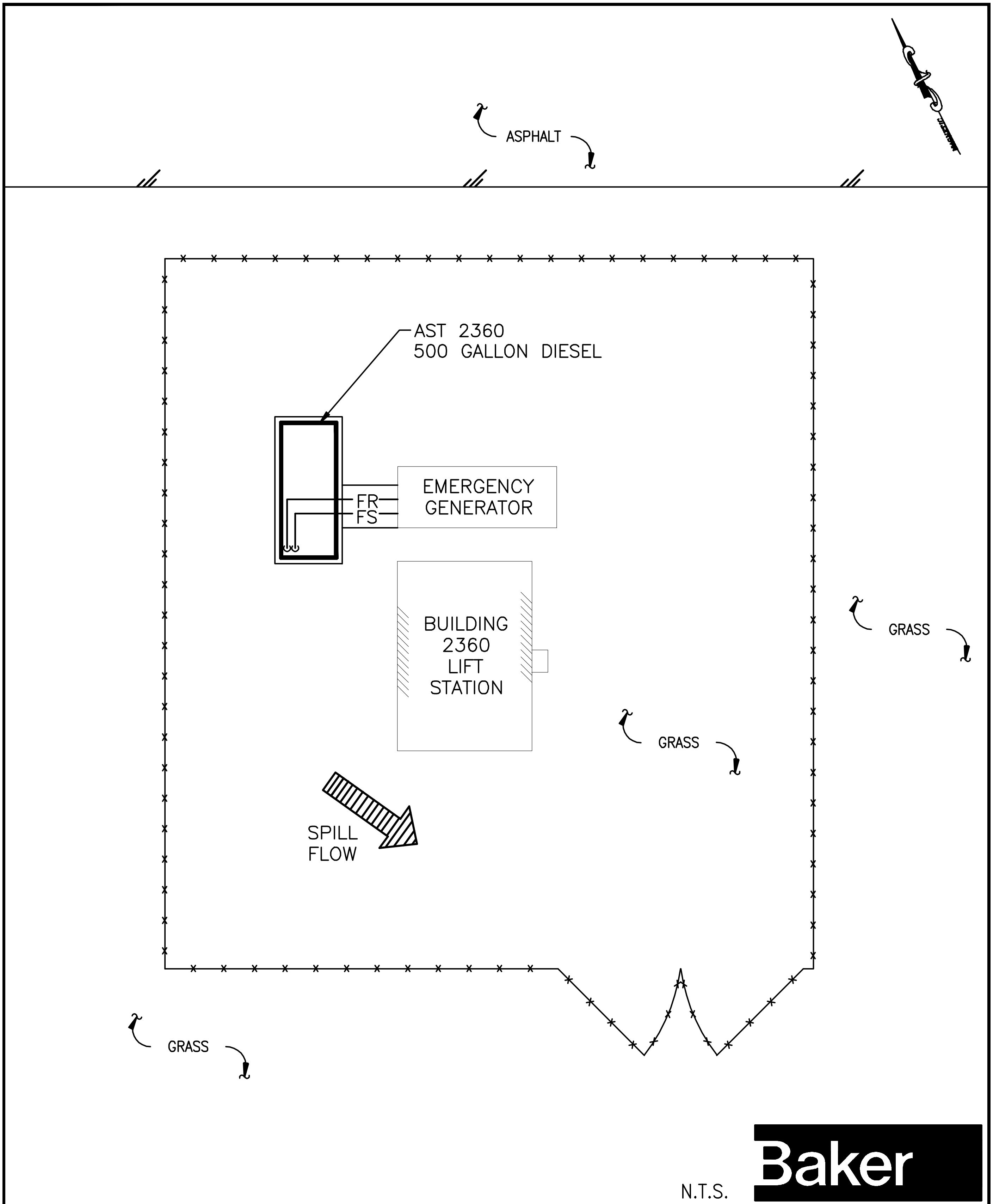
Repair/Replace liquid level gauge, Operations and maintenance on leak detection system

Notes:

Surficial cracks in exterior of tank.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection/Electronic	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



LEGEND:	Project: SPCC PLAN NAVAL ACTIVITIY PUERTO RICO CEIBA, PUERTO RICO	Title:
— FS — - Fuel Supply — FR — - Fuel Return —x—x— - Fence	Date: December 2010	STORAGE TANK SITE LOCATION PLAN FOR AST 2360

AST 2360

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID: 2361
Grid: 6B
Installation Year: 1999
Tank Type: AST
Location: Lift station near golf course
Capacity: 500
Facility Organization: Unknown (BOSC)
Contents: Diesel
Facility: Unknown (BOSC)
Current Use: Emergency Power Generation
Nearest Building: 2361

LABELING AND CODING

Tank ID Label: No
Capacity Label: Yes
Contents Label: No
Fill Port Color Coded: No

TANK INFORMATION

Construction Type: DW
Tank Condition: Good
Tank Color: Aggregate Finish
Construction Material: Concrete/Steel
Tank Manifolded: No
Tank Shape: Rectangular
Corrosion Protection: Corrosion Resistant Material
Tank Dimension: 11' x 4.5' x 3'4"
Tank Manufacturer: ConVault
Lining: None
Model Number: Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection: Visible Gauge/High-Level Alarm
Area Lighting: Inadequate
Collision Barrier: Adequate
Liquid Level Gauge Type: Pop-up Display
HLA Type: Visible Gauge, high level alarm
Gauge Manufacturer: Krueger
HLA Manufacturer: Warrick Controls
Gauge Model: Unknown
HLA Model: DMS-572
Last Gauge Calibration: Unknown
Tank Leak Detection: Warrick Controls
Next Gauge Calibration: 2011
Tank LD Manfuacturer: Warrick Controls
Pump Starter Control: Inaccessible to Unauthorized Personnel
Tank LD Model: DMS-572
Valves Surface Security: Yes
Spill Catchment: Overfill Containment

PIPING SYSTEM

Piping Exposure: Aboveground
Pipe Construction Material: SW Copper
Pipe Condition: Good
Pipe Length: Unknown
Pipe Corrosion Protection: Paint
Supply Pipe Diameter: 3/4"
Pipe Sumps: N/A
Piping Leak Detection: Visible Inspection
Return Pipe Diameter: 3/4"
Pressurized Piping Line Leak Detectors: N/A
Delivery System: Suction
Annual Line Leak Detectors Testing: Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment: DW
Containment Dimensions: N/A
Drain Mechanism: N/A
Containment Volume: N/A
Drainage Outfall: N/A
Drain Security: N/A
Loading/UnLoading Containment: None
Loading/Unloading Containment Recommendations:

Continuation of Tank ID: 2361

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southeast	Probablity of Reaching Water:	Low
Initital Receptor:	Ground at Tank	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	500		

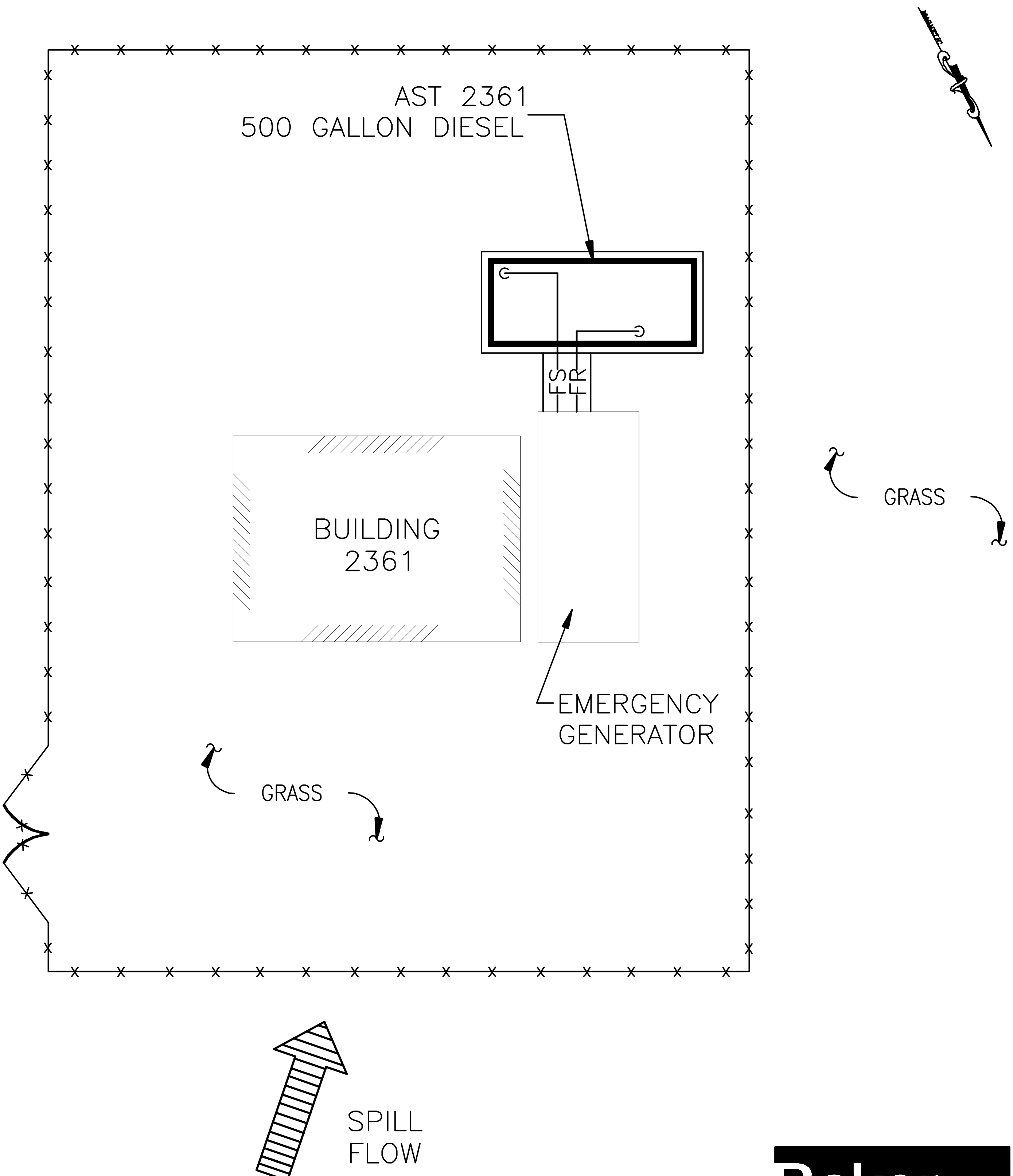
BMP Recommendations

Operations and maintenance on leak detection system

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



N.T.S.

Baker

LEGEND:

— FS — - Fuel Supply
— FR — - Fuel Return
—x—x— - Fence

Project: **SPCC PLAN**
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: **December 2010**

Title: **STORAGE TANK SITE LOCATION PLAN FOR AST 2361**

AST 2361

Quick Find | | Status | Active

GENERAL SYSTEM INFORMATION

Tank ID:	2385-INT	Grid:	6D	Installation Year:	Unknown
Tank Type:	AST-INT	Location:	Lift Station 884		
Capacity:	100	Facility Organization:	Unknown (BOSC)		
Contents:	Diesel	Facility:	Unknown (BOSC)		
Current Use:	Emergency Power Generation	Nearest Building:	2385		

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Good	Tank Color:	Grey
Construction Material:	Steel	Tank Manifolded:	No		
Tank Shape:	Rectangular	Corrosion Protection:	Paint/Under Roof		
Tank Dimension:	75" x 30" x 10"	Tank Manufacturer:	Unknown		
Lining:	None	Model Number:			

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge	Area Lighting:	Adequate	Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	None		
Gauge Manufacturer:	Krueger	HLA Manufacturer:	N/A		
Gauge Model:	Type D	HLA Model:	N/A		
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Visual Inspection		
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	N/A		
Pump Starter Control:	At generator	Tank LD Model:	N/A		
Valves Surface Security:	Yes	Spill Catchment:	Inside dike		

PIPING SYSTEM

Piping Exposure:	N/A			Pipe Construction Material:	Rubber
Pipe Condition:	Good	Pipe Length:	Unknown	Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	1/2"	Pipe Sumps:	None	Piping Leak Detection:	Visual Inspection
Return Pipe Diameter:	Unknown			Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction			Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	12' x 12' x 8"
Drain Mechanism:	Pump Out	Containment Volume:	718
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 2385-INT

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

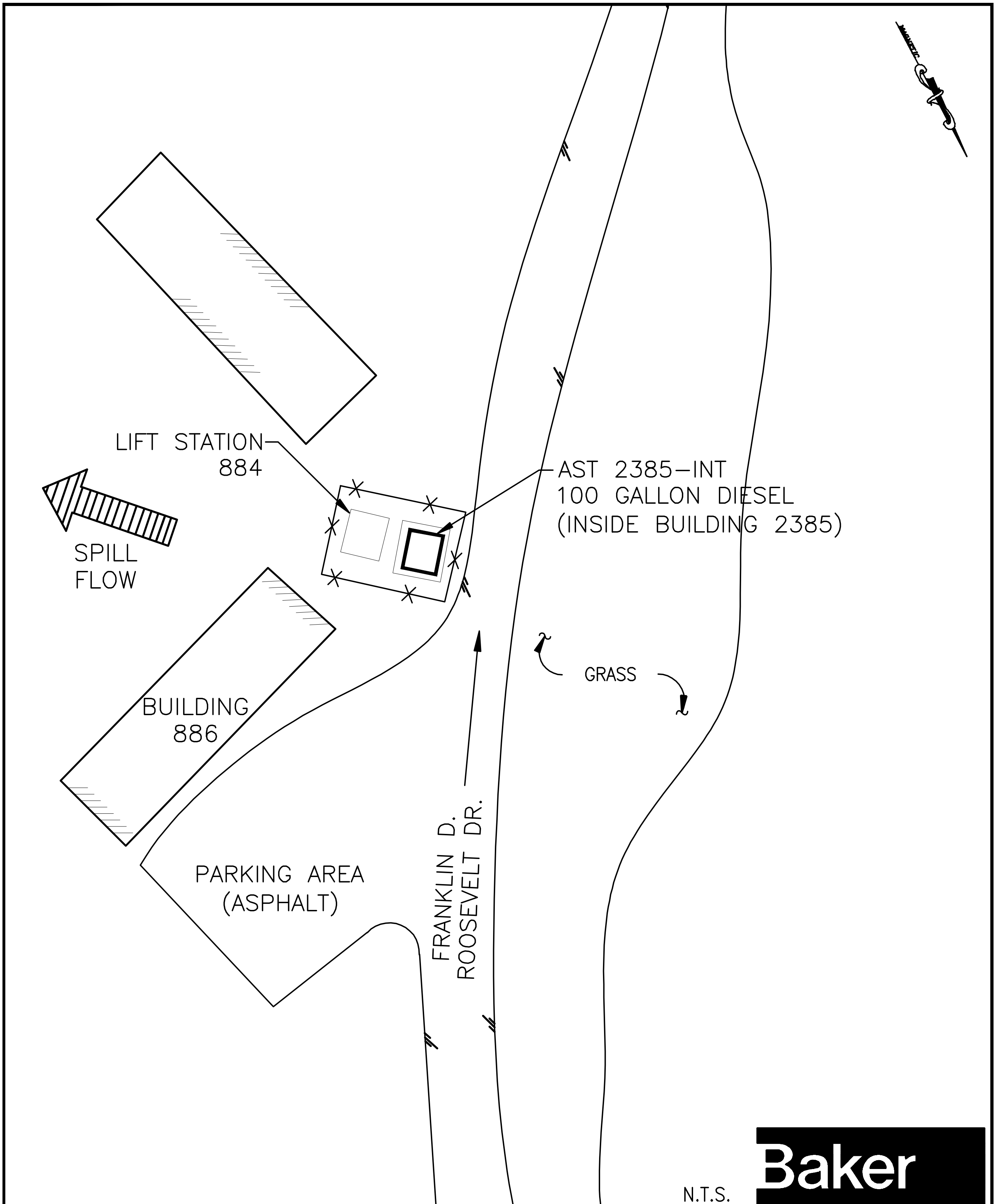
Initial Spill Direction	West	Probablity of Reaching Water:	Low
Initital Receptor:	Concrete Containment Inside Building	Spill Equipment:	None
Intitial Conveyance:	Sheet flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	100		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	1
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	Periodic
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	Unknown
		Next STI Inspection:	N/A



LEGEND:	Project: SPCC PLAN NAVAL ACTIVITIY PUERTO RICO CEIBA, PUERTO RICO	Title:
—x—x— - Fence	Date: December 2010	STORAGE TANK SITE LOCATION PLAN FOR AST 2385-INT

AST 2385-INT

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	2394-INT
Grid:	5E
Installation Year:	1996
Tank Type:	AST-INT
Location:	Building 2394
Capacity:	200
Facility Organization:	Unknown (BOSC)
Contents:	Diesel
Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation
Nearest Building:	2394

LABELING AND CODING

Tank ID Label:	Yes
Capacity Label:	No
Contents Label:	Yes
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Fair
Tank Color:	Black
Construction Material:	Welded Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Painted
Tank Dimension:	94"x36"x10"
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge
Area Lighting:	Adequate
Collision Barrier:	Inadequate
Liquid Level Gauge Type:	Dial Gauge
HLA Type:	None
Gauge Manufacturer:	Unknown
HLA Manufacturer:	N/A
Gauge Model:	Unknown
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	2011
Tank LD Manfuacturer:	N/A
Pump Starter Control:	Adequate
Tank LD Model:	N/A
Valves Surface Security:	Yes
Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	N/A
Pipe Construction Material:	Rubber
Pipe Condition:	Poor
Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	1/2"
Pipe Sumps:	N/A
Piping Leak Detection:	N/A
Return Pipe Diameter:	1/4"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	Drain Plug
Containment Volume:	N/A
Drainage Outfall:	Ground
Drain Security:	No
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 2394-INT

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	West	Probablity of Reaching Water:	Low
Initital Receptor:	Storm Drain	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	200		

BMP Recommendations

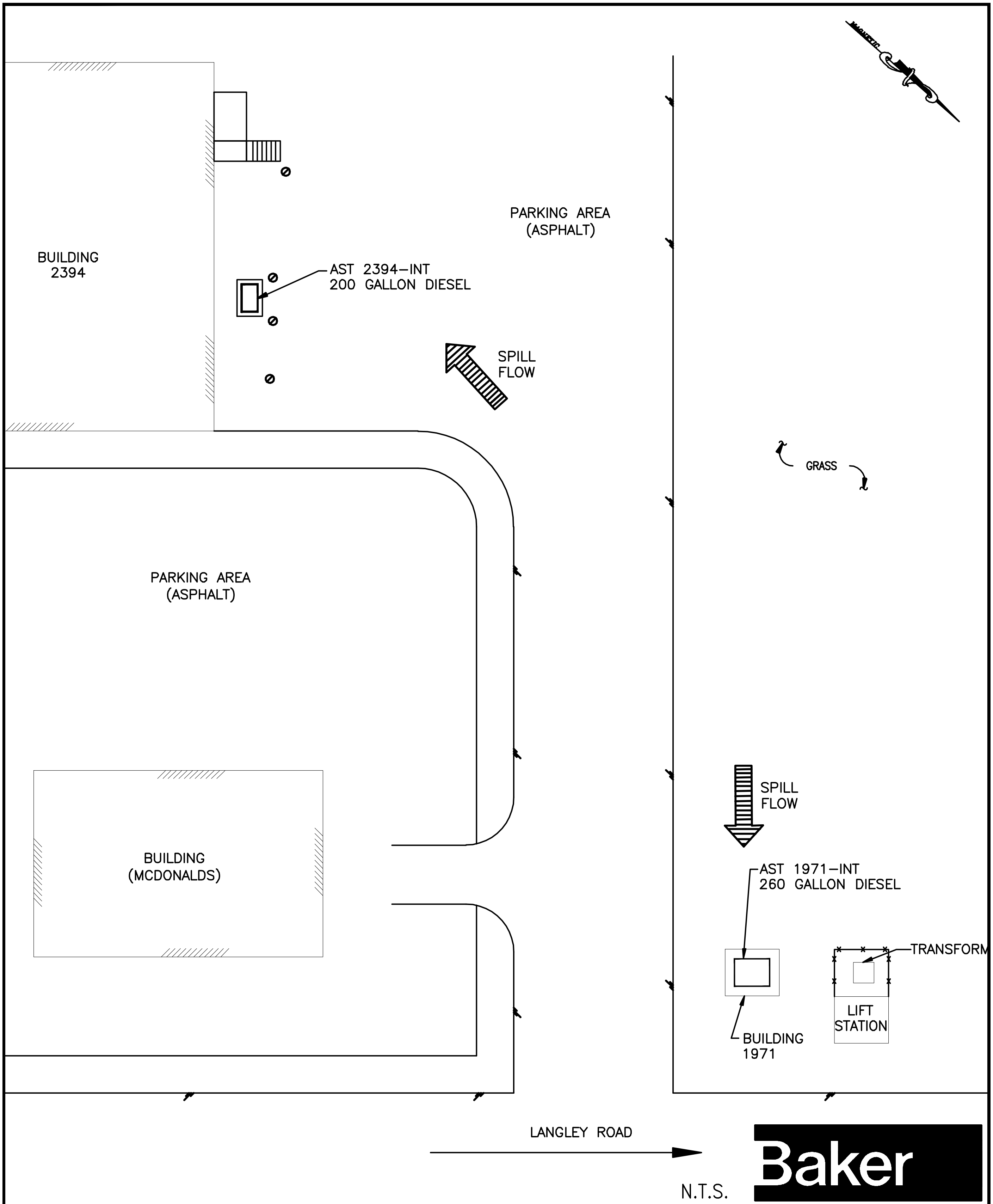
Repair/replace hoses.

Notes:

Rust at fill locations at top of tank.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



LEGEND:

—x—x— - Fence

⊘ - Bollards

Project: **SPCC PLAN**
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: **December 2010**

Title:

STORAGE TANK SITE
LOCATION PLAN FOR
AST's 2394-INT & 1971-INT

AST 2394-INT

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	2406	Grid:	6D
Installation Year:	Unknown		
Tank Type:	AST	Location:	Lift Station Near elementary school
Capacity:	500	Facility Organization:	Unknown (BOSC)
Contents:	Diesel	Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation	Nearest Building:	2406

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Fair
Tank Color:	Yellow		
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Painted
Tank Dimension:	64"x 42"	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	None
Gauge Manufacturer:	Krueger	HLA Manufacturer:	N/A
Gauge Model:	Unknown	HLA Model:	N/A
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	N/A
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Fair	Pipe Length:	Unknown
Pipe Corrosion Protection:	None		
Supply Pipe Diameter:	3/4"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	3/4"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	110" x 78" x 28"
Drain Mechanism:	Drain Valve	Containment Volume:	907
Drainage Outfall:	Ground Outside Dike	Drain Security:	Yes
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 2406

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	East	Probablity of Reaching Water:	Low
Inititial Receptor:	Secondary Containment	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	500		

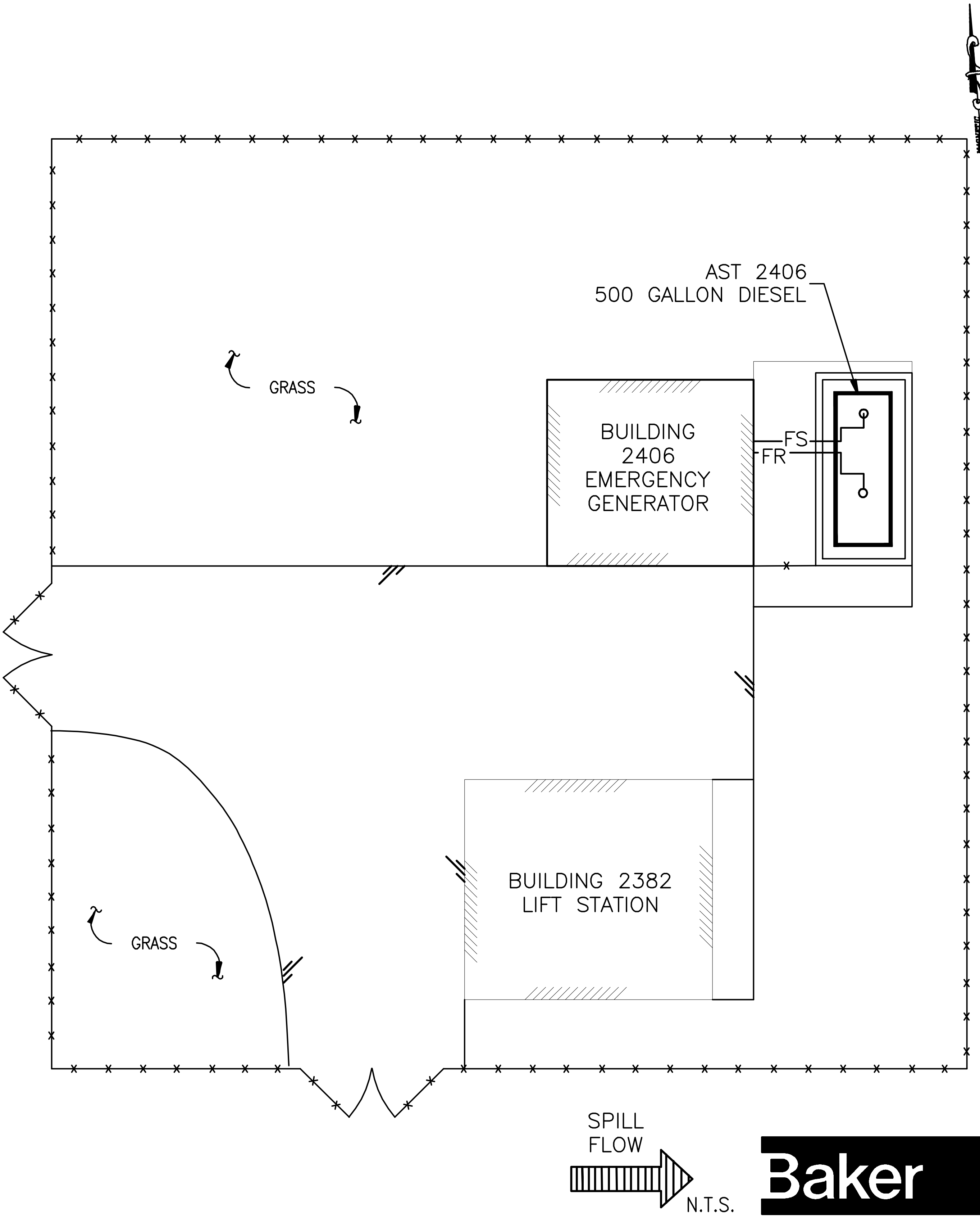
BMP Recommendations

Repair/replace visible gauge, provide locking mechanism for drainage valve. Repair and repaint piping for corrosion protection or replace with a corrosion resistant material.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	1
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	Periodic/External
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	Unknown	STI External Inspection:	20 Years
Next Containment Sump Test:	2011	Last STI Inspection:	Unknown
		Next STI Inspection:	2011



Baker

LEGEND:	Project: SPCC PLAN NAVAL ACTIVITIY PUERTO RICO CEIBA, PUERTO RICO	Title: STORAGE TANK SITE LOCATION PLAN FOR AST 2406
—FS— - Fuel Supply —FR— - Fuel Return —x—x— - Fence	Date: December 2010	

AST 2406

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	2426	Grid:	5G
Installation Year:	Unknown		
Tank Type:	AST	Location:	Wash Rack
Capacity:	500	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Emergency Power Generation	Nearest Building:	2426

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Fair
Tank Color:	Red		
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Paint
Tank Dimension:	68" x 44"	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	None	HLA Type:	None
Gauge Manufacturer:	N/A	HLA Manufacturer:	N/A
Gauge Model:	N/A	HLA Model:	N/A
Last Gauge Calibration:	N/A	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	At generator	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Copper
Pipe Condition:	Good	Pipe Length:	10'
Pipe Corrosion Protection:	Corrosion Resistant Material		
Supply Pipe Diameter:	1/2"	Pipe Sumps:	None
Piping Leak Detection:	Visual Inspection		
Return Pipe Diameter:	1/2"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	140" x 58" x 30"
Drain Mechanism:	Drain Valve	Containment Volume:	900
Drainage Outfall:	Ground	Drain Security:	No
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 2426

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

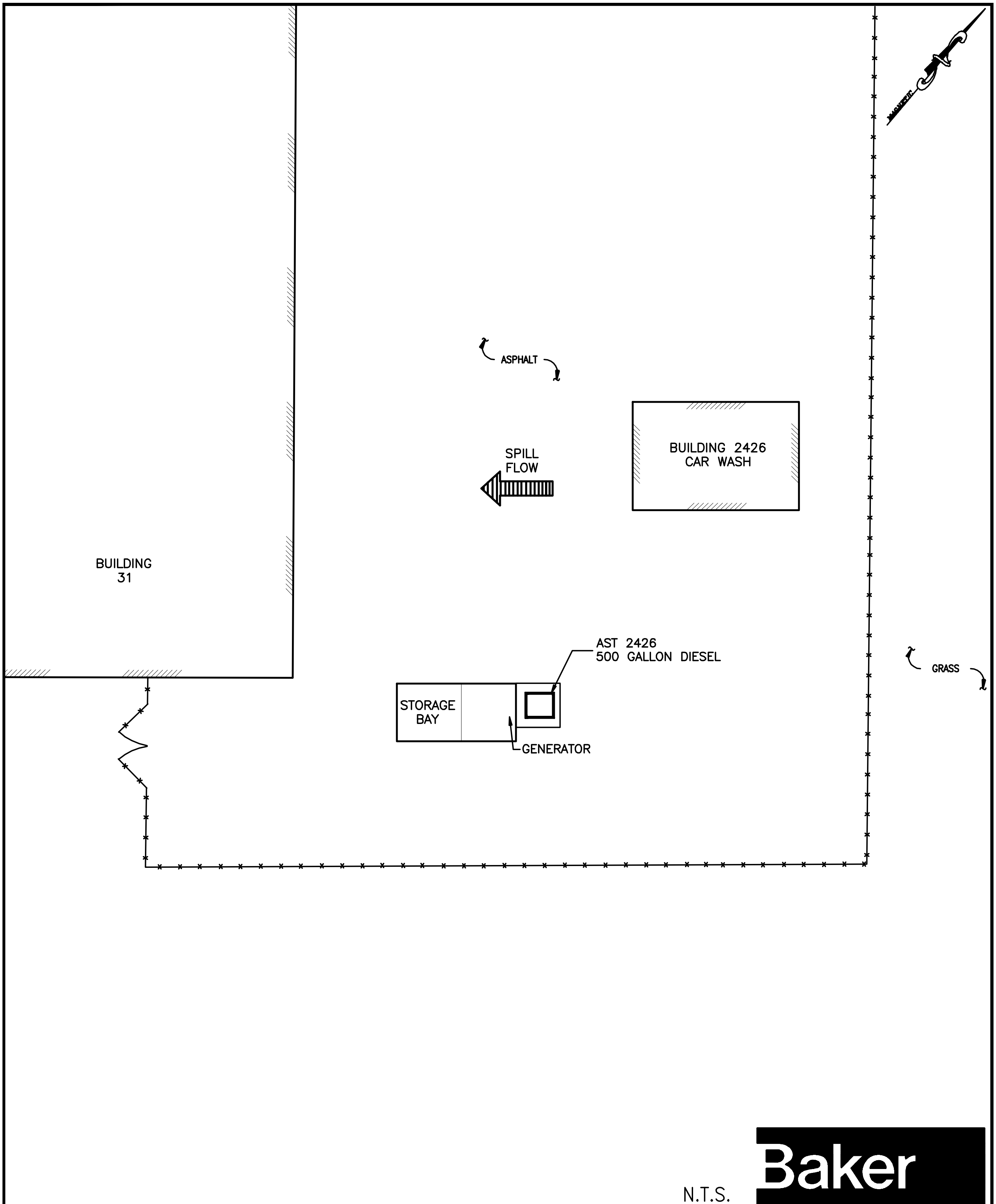
Initial Spill Direction	Southwest	Probablity of Reaching Water:	Low
Initital Receptor:	Concrete Containment	Spill Equipment:	None
Intitial Conveyance:	Sheet flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	500		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	1
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	Periodic/External
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	Unknown	STI External Inspection:	20 Years
Next Containment Sump Test:	2011	Last STI Inspection:	Unknown
		Next STI Inspection:	2011



Baker

LEGEND:
—x—x— - Fence

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title: STORAGE TANK SITE
LOCATION PLAN FOR
AST 2426

AST 2426

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	542	Grid:	6B
Installation Year:	1982		
Tank Type:	AST	Location:	Building 2016, Lift Station 542
Capacity:	500	Facility Organization:	Unknown (BOSC)
Contents:	Diesel	Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation	Nearest Building:	542/2016

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Fair
Tank Color:	Yellow		
Construction Material:	Welded Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Painted
Tank Dimension:	64" x 42"	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm	Area Lighting:	Inadequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	None	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	N/A	HLA Manufacturer:	Pneumercator
Gauge Model:	N/A	HLA Model:	2-501
Last Gauge Calibration:	N/A	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	14'
Pipe Corrosion Protection:	Paint		
Supply Pipe Diameter:	1"	Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	1"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	9' x 6.5' x 2'
Drain Mechanism:	Pump Out	Containment Volume:	890
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 542

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

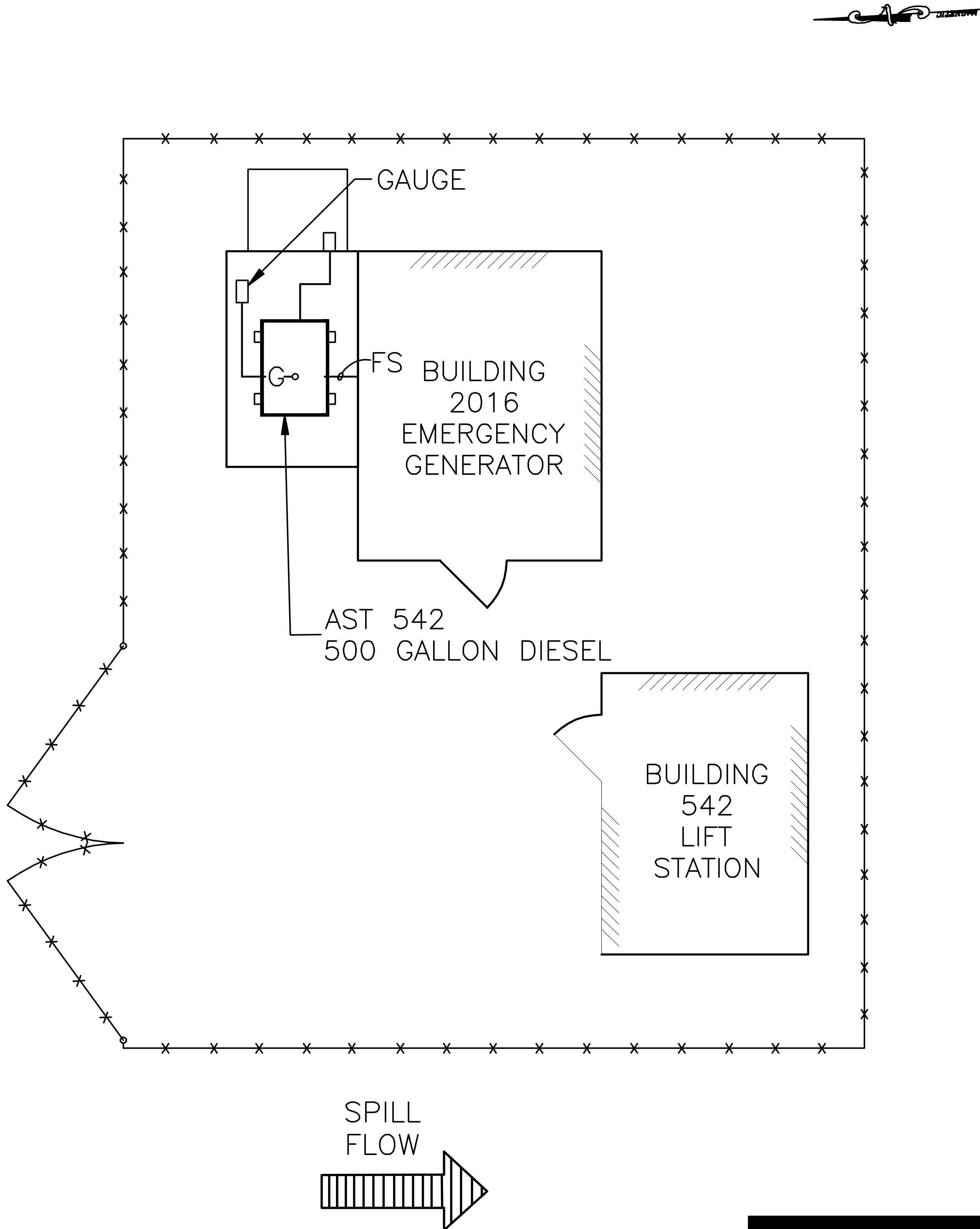
Initial Spill Direction	South
Initital Receptor:	Secondary Containment Inside Building
Intitial Conveyance:	Sheet Flow
Probablity of Reaching Water:	Low
Spill Equipment:	None
Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	500

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly
Monthly Leak Detection Monitoring:	Visual Inspection
CP Bimonthly System Check:	N/A
Last Cathodic Protection Test:	N/A
Next Cathodic Protection Test:	N/A
Last Spill Bucket Test:	N/A
Next Spill Bucket Test:	N/A
Last Containment Sump Test:	Unknown
Next Containment Sump Test:	2011
Last Formal External API 653:	N/A
Next Formal External API 653:	N/A
Last Formal Piping Inspection:	N/A
Next Formal Piping Inspection:	N/A
STI Inspection Category:	1
STI Inspection Schedule:	Periodic/External
STI Internal Inspection:	N/A
STI External Inspection:	20 Years
Last STI Inspection:	Unknown
Next STI Inspection:	2011



Baker

LEGEND:

— FS — - Fuel Supply
— G — - Gauge Line
—x—x— - Fence

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title:

STORAGE TANK SITE LOCATION PLAN FOR AST 542

AST 542

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	737
Grid:	6D
Installation Year:	Unknown
Tank Type:	AST
Location:	Telephone Office
Capacity:	500
Facility Organization:	Unknown (BOSC)
Contents:	Diesel
Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation
Nearest Building:	737

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	No
Contents Label:	No
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Good
Tank Color:	Yellow
Construction Material:	Steel
Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder
Corrosion Protection:	Painted
Tank Dimension:	48" x 38"
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	None
Gauge Manufacturer:	Unknown
HLA Manufacturer:	N/A
Gauge Model:	Unknown
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	2011
Tank LD Manfuacturer:	N/A
Pump Starter Control:	Adequate
Tank LD Model:	N/A
Valves Surface Security:	Yes
Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	SW Steel
Pipe Condition:	Fair
Pipe Length:	Unknown
Pipe Corrosion Protection:	Paint
Supply Pipe Diameter:	3/4"
Pipe Sumps:	N/A
Piping Leak Detection:	None
Return Pipe Diameter:	3/4"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block
Containment Dimensions	10' x 7' x 2'
Drain Mechanism:	Drain Valve
Containment Volume:	1100
Drainage Outfall:	Ground Outside Dike
Drain Security:	No
Loading/UnLoading Containment:	N/A
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 737

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southeast	Probablity of Reaching Water:	Low
Initital Receptor:	Secondary Containment	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	500		

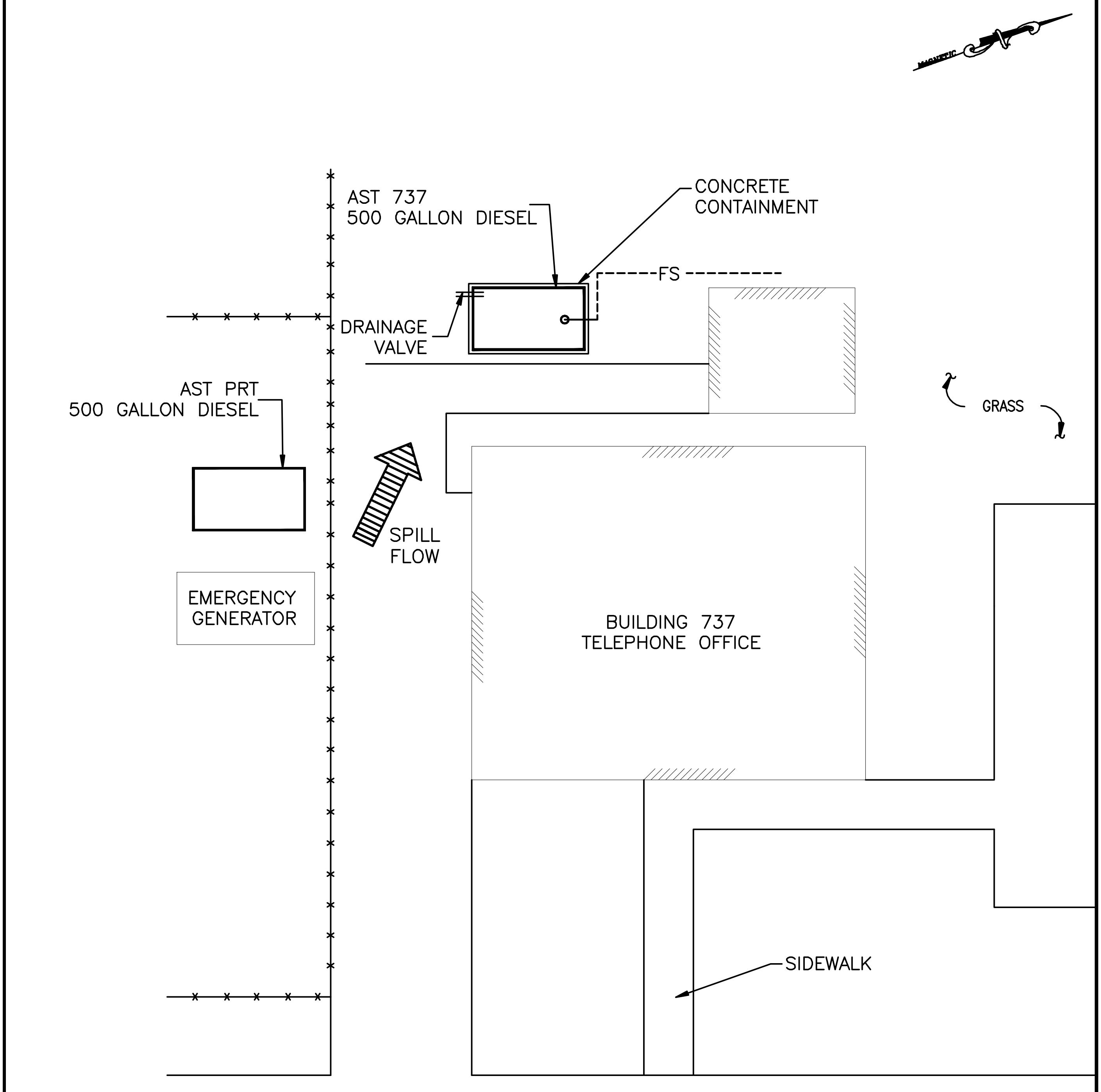
BMP Recommendations

Provide valve security

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	1
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	Periodic/External
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	Unknown	STI External Inspection:	20 Years
Next Containment Sump Test:	2011	Last STI Inspection:	Unknown
		Next STI Inspection:	2011



N.T.S.

Baker

LEGEND:

— FS — - Fuel Supply
—x—x— - Fence

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title:

STORAGE TANK SITE LOCATION PLAN FOR AST's 737 & PRT

AST 737

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	784
Grid:	4E
Installation Year:	Unknown
Tank Type:	AST
Location:	784
Capacity:	150
Facility Organization:	Unknown (BOSC)
Contents:	Diesel
Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation
Nearest Building:	784

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	No
Contents Label:	No
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Fair
Tank Color:	Yellow
Construction Material:	Steel
Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder
Corrosion Protection:	Paint
Tank Dimension:	48" x 30"
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None
Area Lighting:	Inadequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Clock/Remote Display
HLA Type:	None
Gauge Manufacturer:	Hersey
HLA Manufacturer:	N/A
Gauge Model:	Junior Model
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	2010
Tank LD Manfuacturer:	N/A
Pump Starter Control:	At generator
Tank LD Model:	N/A
Valves Surface Security:	Yes
Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	DW Steel
Pipe Condition:	Fair
Pipe Length:	Unknown
Pipe Corrosion Protection:	Paint
Supply Pipe Diameter:	1/2"
Pipe Sumps:	N/A
Piping Leak Detection:	Visual Inspection
Return Pipe Diameter:	1/2"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block
Containment Dimensions	64" x 46" x 20"
Drain Mechanism:	Pump Out
Containment Volume:	255
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 784

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

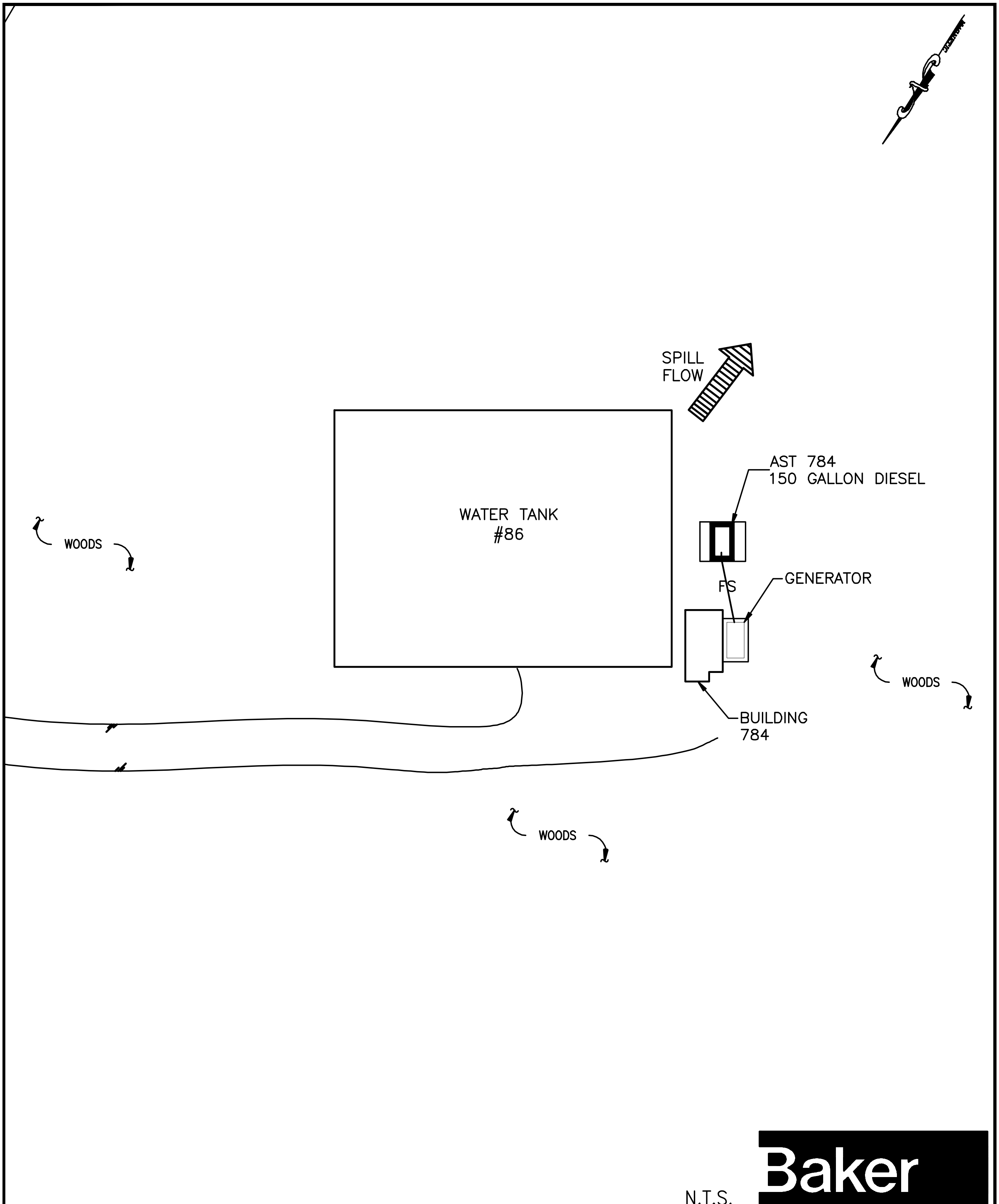
Initial Spill Direction	South	Probablity of Reaching Water:	Low
Initital Receptor:	Concrete Containment	Spill Equipment:	None
Intitial Conveyance:	Sheet flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	150		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	1
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	Periodic/External
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	Unknown	STI External Inspection:	20 Years
Next Containment Sump Test:	2011	Last STI Inspection:	Unknown
		Next STI Inspection:	2011



— FS — - Fuel Supply

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title:

STORAGE TANK SITE
LOCATION PLAN FOR
AST 784

AST 784

Quick Find:

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	798	Grid:	4F
Installation Year:	1999		
Tank Type:	AST	Location:	Fire Department
Capacity:	500	Facility Organization:	Unknown (BOSC)
Contents:	Diesel	Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation	Nearest Building:	798

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	Aggregate Finish		
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 4.5' x 3'4"	Tank Manufacturer:	ConVault
Lining:	N/A	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Unknown	HLA Manufacturer:	Warrick Controls
Gauge Model:	Unknown	HLA Model:	DMS-572
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Warrick Controls
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	Warrick Controls
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	DMS-572
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Copper
Pipe Condition:	Good	Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material		
Supply Pipe Diameter:	3/4"	Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	3/4"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 798

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

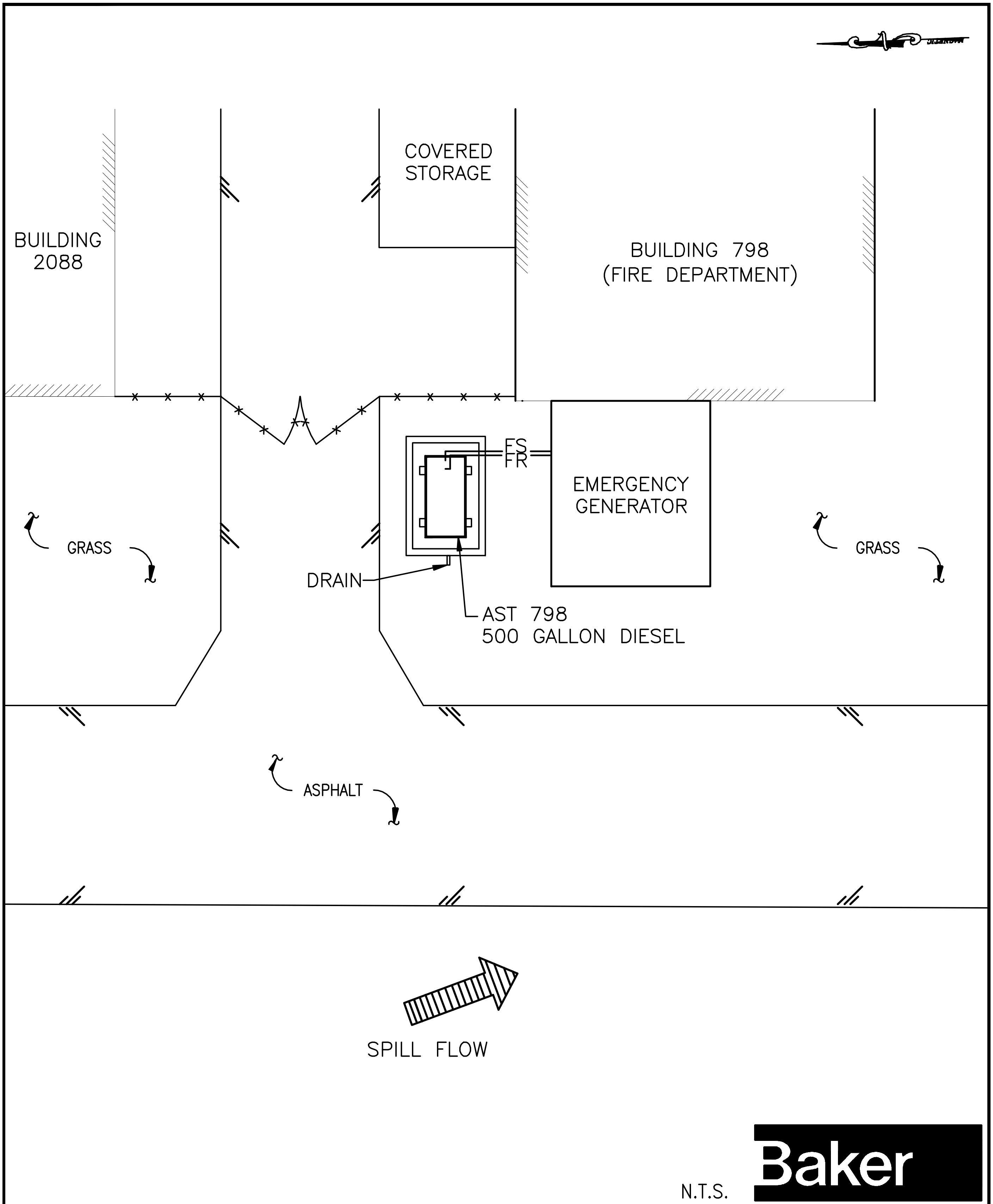
Initial Spill Direction	South	Probablity of Reaching Water:	Low
Inititial Receptor:	Parking lot	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	500		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection/Electronic	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



Baker

LEGEND:

— FS — - Fuel Supply
— FR — - Fuel Return
—x—x— - Fence

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title: STORAGE TANK SITE
LOCATION PLAN FOR
AST 798

AST 798

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	88
Grid:	5D
Installation Year:	1998
Tank Type:	AST
Location:	Water Treatment Plant
Capacity:	500
Facility Organization:	Unknown (BOSC)
Contents:	Diesel
Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation
Nearest Building:	88

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	Off White
Construction Material:	Concrete/Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 4.5' x 3'4"
Tank Manufacturer:	ConVault
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Unknown
HLA Manufacturer:	Warrick Controls
Gauge Model:	Unknown
HLA Model:	DMS-573
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Warrick Controls
Next Gauge Calibration:	2011
Tank LD Manfuacturer:	Warrick Controls
Pump Starter Control:	Inaccessible to Unauthorized Personnel
Tank LD Model:	DMS-573
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	SW Copper
Pipe Condition:	Good
Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	1/2"
Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	1/2"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 88

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	North	Probablity of Reaching Water:	Medium
Initital Receptor:	Ground at Tank	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	500		

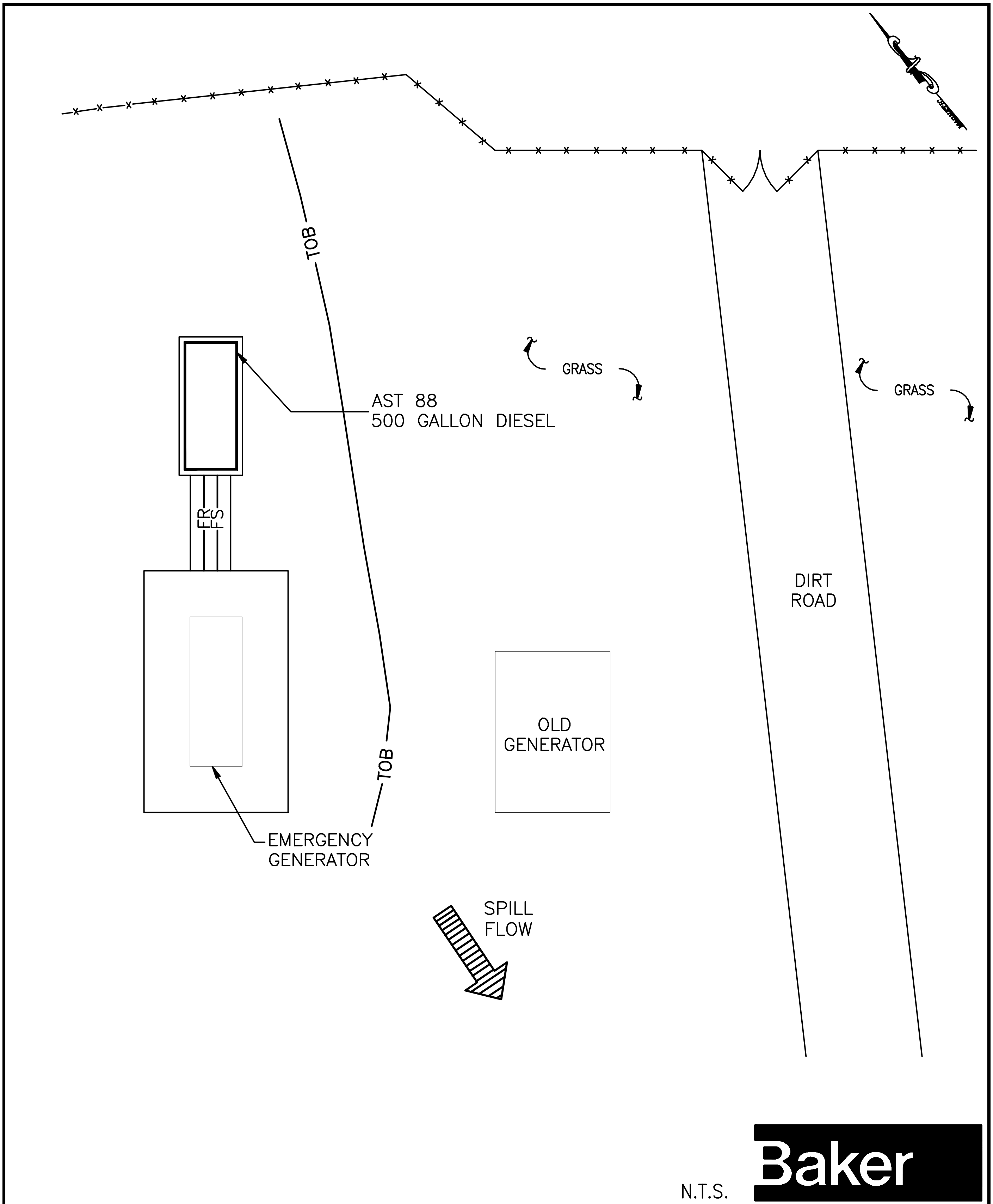
BMP Recommendations

Repair/replace visual gauge.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



LEGEND:

- —FS— - Fuel Supply
- —FR— - Fuel Return
- —x—x— - Fence
- —TOB— - Top of Bank

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title: STORAGE TANK SITE LOCATION PLAN FOR AST 88

AST 88

Quick Find

Status: Active

GENERAL SYSTEM INFORMATION

Tank ID:	PRT	Grid:	6D
Installation Year:	2008		
Tank Type:	AST	Location:	PRT Trailer
Capacity:	500	Facility Organization:	Puerto Rico Telephone (Non-NAPR)
Contents:	Diesel	Facility:	Puerto Rico Telephone (Non-NAPR)
Current Use:	Emergency Power Generation	Nearest Building:	737

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	Off White		
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 4'6" x 3'4"	Tank Manufacturer:	ConVault
Lining:	Unknown	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge	Area Lighting:	Inadequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	None
Gauge Manufacturer:	Krueger	HLA Manufacturer:	N/A
Gauge Model:	Unknown	HLA Model:	N/A
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Interstitial Monitor
Next Gauge Calibration:	2011	Tank LD Manfuacturer:	Krueger
Pump Starter Control:	At generator	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	Unknown
Pipe Corrosion Protection:	None		
Supply Pipe Diameter:	3/4"	Pipe Sumps:	None
Piping Leak Detection:	None		
Return Pipe Diameter:	3/4"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	None	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: PRT

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southeast	Probablity of Reaching Water:	Low
Initital Receptor:	Concrete Pad/ Ground	Spill Equipment:	None
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	500		

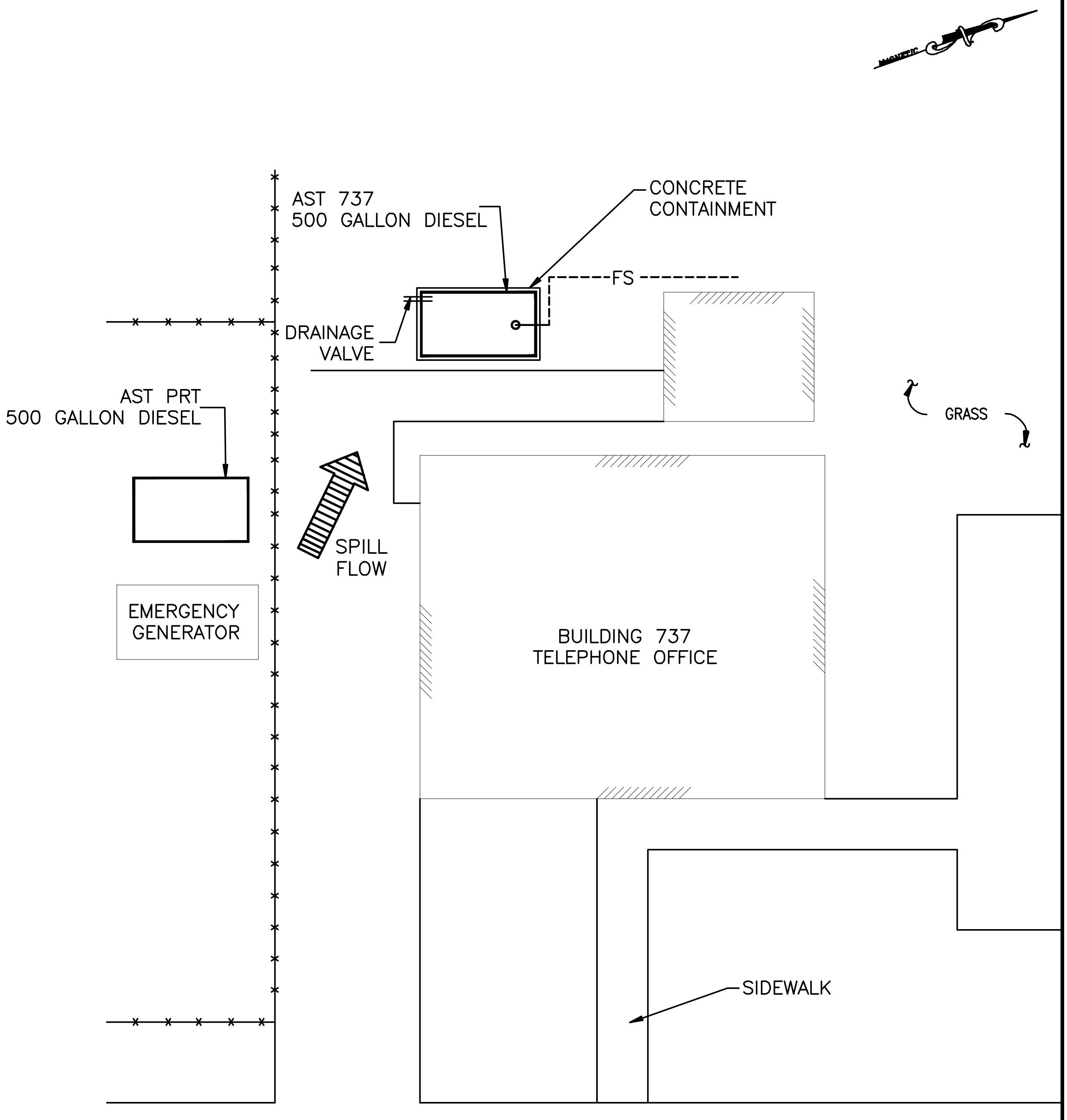
BMP Recommendations

Notes:

Tank is not under the authority of NAPR.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	Monthly	Last Formal External API 653:	N/A
Monthly Leak Detection Monitoring:	Visual Inspection	Next Formal External API 653:	N/A
CP Bimonthly System Check:	N/A	Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:	N/A	Next Formal Piping Inspection:	N/A
Next Cathodic Protection Test:	N/A	STI Inspection Category:	N/A
Last Spill Bucket Test:	N/A	STI Inspection Schedule:	N/A
Next Spill Bucket Test:	N/A	STI Internal Inspection:	N/A
Last Containment Sump Test:	N/A	STI External Inspection:	N/A
Next Containment Sump Test:	N/A	Last STI Inspection:	N/A
		Next STI Inspection:	N/A



N.T.S.

Baker

LEGEND:

— FS — - Fuel Supply
—x—x— - Fence

Project: SPCC PLAN
NAVAL ACTIVITIY PUERTO RICO
CEIBA, PUERTO RICO

Date: December 2010

Title:
STORAGE TANK SITE LOCATION PLAN FOR AST's 737 & PRT

AST PRT

Inactive Tanks

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	1080
Grid:	4G
Installation Year:	1968
Tank Type:	AST Bunkered
Location:	Fuel Farm
Capacity:	1165000
Facility Organization:	Fuels Division
Contents:	DFM
Facility:	Fuels Division
Current Use:	Bulk Fuel Storage
Nearest Building:	1982

LABELING AND CODING

Tank ID Label:	Yes
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Unknown
Tank Color:	Underground
Construction Material:	Welded Steel
Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder
Corrosion Protection:	Paint
Tank Dimension:	100'x20'
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	N/A
Liquid Level Gauge Type:	Automatic Tank Gauge
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton
HLA Manufacturer:	Barton
Gauge Model:	Unknown
HLA Model:	Unknown
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active
Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel
Tank LD Model:	Unknown
Valves Surface Security:	Yes
Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Cathodic Protection
Supply Pipe Diameter:	12"
Pipe Sumps:	N/A
Piping Leak Detection:	None
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	Unknown
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 1080

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Medium
Initital Receptor:	Unknown	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	1994
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank is active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Unknown
		Next STI Inspection:	Before Tank is active

AST Bunkered 1080 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	1082
Grid:	4G
Installation Year:	1968
Tank Type:	AST Bunkered
Location:	Fuel Farm
Capacity:	1165000
Facility Organization:	Fuels Division
Contents:	DFM
Facility:	Fuels Division
Current Use:	Bulk Fuel Storage
Nearest Building:	1982

LABELING AND CODING

Tank ID Label:	Yes
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Unknown
Tank Color:	Underground
Construction Material:	Welded Steel
Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder
Corrosion Protection:	Paint
Tank Dimension:	100'x20'
Tank Manufacturer:	Unknown
Lining:	Interior Polyurethane Coating
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	N/A
Liquid Level Gauge Type:	Automatic Tank Gauge
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton
HLA Manufacturer:	Barton
Gauge Model:	Unknown
HLA Model:	Unknown
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active
Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel
Tank LD Model:	Unknown
Valves Surface Security:	Yes
Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	None
Supply Pipe Diameter:	12"
Pipe Sumps:	N/A
Piping Leak Detection:	None
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	Unknown
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 1082

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Medium
Initital Receptor:	Unknown	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before Tank is Active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	1997
		Next STI Inspection:	Before Tank is active

AST Bunkered 1082 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	1084	Grid:	4F
Installation Year:	1968		
Tank Type:	AST Bunkered	Location:	Fuel Farm
Capacity:	1181000	Facility Organization:	Fuels Division
Contents:	JP-5	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	1982

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Unknown
Tank Color:	Underground		
Construction Material:	Welded Steel	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Paint
Tank Dimension:	100'x20'	Tank Manufacturer:	Unknown
Lining:	Interior Polyurethane Coating	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	N/A		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton	HLA Manufacturer:	Barton
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	Cathodic Protection		
Supply Pipe Diameter:	12"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 1084

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Medium
Initital Receptor:	Unknown	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank is Active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	04/00
		Next STI Inspection:	Before tank is Active

AST Bunkered 1084 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	1086
Grid:	4F
Installation Year:	1968
Tank Type:	AST Bunkered
Location:	Fuel Farm
Capacity:	1181000
Facility Organization:	Fuels Division
Contents:	JP-5
Facility:	Fuels Division
Current Use:	Bulk Fuel Storage
Nearest Building:	1982

LABELING AND CODING

Tank ID Label:	Yes
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Unknown
Tank Color:	Underground
Construction Material:	Welded Steel
Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder
Corrosion Protection:	Paint
Tank Dimension:	100'x20'
Tank Manufacturer:	Unknown
Lining:	Interior Polyurethane Coating
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	N/A
Liquid Level Gauge Type:	Automatic Tank Gauge
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton
HLA Manufacturer:	Barton
Gauge Model:	Unknown
HLA Model:	Unknown
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active
Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel
Tank LD Model:	Unknown
Valves Surface Security:	Yes
Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Cathodic Protection
Supply Pipe Diameter:	12"
Pipe Sumps:	N/A
Piping Leak Detection:	None
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	Unknown
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 1086

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown
Initital Receptor:	Unknown
Intitial Conveyance:	Unknown
Probablity of Reaching Water:	Medium
Spill Equipment:	Unknown
Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

If made active: Operations and maintenance ATG and CP system. Provide secondary containment & HLCV.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	Never
Next Formal Piping Inspection:	2003
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	Tracer tightness test, 1994-Pass
Next STI Inspection:	Before Tank is active

AST Bunkered 1086 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	1088	Grid:	4G
Installation Year:	1968		
Tank Type:	AST Bunkered	Location:	Fuel Farm
Capacity:	425000	Facility Organization:	Fuels Division
Contents:	JP-5	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	1987

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Unknown
Tank Color:	Underground		
Construction Material:	Welded Steel	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Paint
Tank Dimension:	100'x20'	Tank Manufacturer:	Unknown
Lining:	Interior Polyurethane Coating	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	N/A		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton	HLA Manufacturer:	Barton
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	None		
Supply Pipe Diameter:	6"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 1088

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Low
Initital Receptor:	Unknown	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Unknown
		Next STI Inspection:	Before tank active

AST Bunkered 1088 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	1691-M	Grid:	7D
		Installation Year:	Unknown
Tank Type:	AST	Location:	Capehart WWTP
Capacity:	5000	Facility Organization:	Unknown (BOSC)
Contents:	Methanol	Facility:	Unknown (BOSC)
Current Use:	Other	Nearest Building:	1691

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Fair
		Tank Color:	Blue
Construction Material:	Welded Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Paint
Tank Dimension:	8 x 23	Tank Manufacturer:	Unknown
Lining:	Not Available	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-level Alarm	Area Lighting:	Adequate
		Collision Barrier:	Adequate
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Veeder-Root	HLA Manufacturer:	Veeder-Root
Gauge Model:	DMS-572	HLA Model:	DMS-572
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Audible (Electronic)
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Veeder-Root
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	DMS-572
Valves Surface Security:	Yes	Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	Unknown
		Pipe Corrosion Protection:	Paint
Supply Pipe Diameter:	2"	Pipe Sumps:	N/A
		Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	1"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	Drain Valve	Containment Volume:	N/A
Drainage Outfall:	Ground outside dike	Drain Security:	No
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 1691-M

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southeast	Probablity of Reaching Water:	High
Initital Receptor:	Ground at Tank	Spill Equipment:	
Intitial Conveyance:	Sheet Flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Operations and maintenance on leak detection system

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST 1691M

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	1708-INT	Grid:	4E
Installation Year:	Unknown		
Tank Type:	AST-INT	Location:	1708
Capacity:	75	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Emergency Power Generation	Nearest Building:	1708

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Fair
Tank Color:	Orange		
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Paint
Tank Dimension:	54" x 54" x 8"	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None	Area Lighting:	Adequate
Collision Barrier:	Inadequate		
Liquid Level Gauge Type:	Dial Gauge	HLA Type:	None
Gauge Manufacturer:	Unknown	HLA Manufacturer:	N/A
Gauge Model:	Unknown	HLA Model:	N/A
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	N/A
Pump Starter Control:	At generator	Tank LD Model:	N/A
Valves Surface Security:	No	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	Rubber
Pipe Condition:	Fair	Pipe Length:	N/A
Pipe Corrosion Protection:	Corrosion Resistant Material		
Supply Pipe Diameter:	3/8"	Pipe Sumps:	None
Piping Leak Detection:	N/A		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW Steel	Containment Dimensions	N/A
Drain Mechanism:	Plug	Containment Volume:	N/A
Drainage Outfall:	Ground	Drain Security:	No
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 1708-INT

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southwest	Probablity of Reaching Water:	Low
Initital Receptor:	Ground	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	

AST 1708-INT

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	1758 M	Grid:	6H
Installation Year:	Unknown		
Tank Type:	AST	Location:	Forrestal WWTP
Capacity:	5000	Facility Organization:	Unknown (BOSC)
Contents:	Methanol	Facility:	Unknown (BOSC)
Current Use:	Other	Nearest Building:	1758

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	Blue		
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Paint
Tank Dimension:	8 x 23	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visual Gauge	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Petrometer-20	HLA Manufacturer:	Petrometer-20
Gauge Model:	Model 20TX	HLA Model:	Model 20TX
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Petrometer
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Petrometer
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	20TX
Valves Surface Security:	Yes	Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	Unknown
Pipe Corrosion Protection:	Paint		
Supply Pipe Diameter:	1.5"	Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	2"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 1758 M

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South
Initital Receptor:	Outfall NR-024
Intitial Conveyance:	
Probablity of Reaching Water:	Low
Spill Equipment:	None
Ultimate Discharge	
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

Operations and maintenance on leak detection system

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	Never
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	Never
Next STI Inspection:	

AST 1758M

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	1808
Grid:	4E
Installation Year:	1996
Tank Type:	AST
Location:	Galley
Capacity:	5000
Facility Organization:	Unknown
Contents:	Diesel
Facility:	Unknown
Current Use:	Emergency Power Generation
Nearest Building:	1808

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	Yes
Contents Label:	No
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	Aggregate Finish
Construction Material:	Concrete/Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	13' x 12' x 7'
Tank Manufacturer:	ConVault
Lining:	30-mil HDPE
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Hi-Level Alarm/Guillotine Valve
Area Lighting:	None
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Unknown
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Unknown
HLA Manufacturer:	Soil Sentry
Gauge Model:	Unknown
HLA Model:	TLM-830
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Soil Sentry
Next Gauge Calibration:	Before tank is active
Tank LD Manfuacturer:	Soil Sentry
Pump Starter Control:	Unknown
Tank LD Model:	TLM-830
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	SW Steel
Pipe Condition:	Good
Pipe Length:	Unknown
Pipe Corrosion Protection:	Impressed Current
Supply Pipe Diameter:	3/4"
Pipe Sumps:	N/A
Piping Leak Detection:	None
Return Pipe Diameter:	3/4"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 1808

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	West	Probablity of Reaching Water:	Low
Initital Receptor:	Outfall NR-007	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Operations and maintenance on leak detection system. Provide Lighting. Provide marking for Oil type

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	N/A
		Next STI Inspection:	

AST 1808

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	1995	Grid:	4G
Installation Year:	1978		
Tank Type:	AST	Location:	Fuel Farm
Capacity:	4200000	Facility Organization:	Fuels Division
Contents:	DFM	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Good
Tank Color:	White		
Construction Material:	Welded Steel	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Painted
Tank Dimension:	140' x 36'	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-level Alarm	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton	HLA Manufacturer:	Barton
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	Cathodic Protection		
Supply Pipe Diameter:	16"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	N/A
Drain Mechanism:	Drain Valve	Containment Volume:	5086740
Drainage Outfall:	Oil Water Separator	Drain Security:	Yes
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 1995

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southwest	Probablity of Reaching Water:	Medium
Initital Receptor:	Outfall 002	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

If tank placed back into service: repair containment. tightness test piping, lock secondary containment drainage valve. Operations and maintenance on ATG system and CP system. Add HLCV

Notes:

Tank and associated lines have been cleaned and decommissioned.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	2003
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	2000 (missing)
		Next STI Inspection:	2010

AST 1995

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	1996
Grid:	4G
Installation Year:	1978
Tank Type:	AST
Location:	Fuel Farm
Capacity:	4200000
Facility Organization:	Fuels Division
Contents:	DFM
Facility:	Fuels Division
Current Use:	Bulk Fuel Storage
Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Yes
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Good
Tank Color:	White
Construction Material:	Welded Steel
Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder
Corrosion Protection:	Painted
Tank Dimension:	140' x 36'
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-level Alarm
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Automatic Tank Gauge
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton
HLA Manufacturer:	Barton
Gauge Model:	Unknown
HLA Model:	Unknown
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active
Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel
Tank LD Model:	Unknown
Valves Surface Security:	Yes
Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Cathodic Protection
Supply Pipe Diameter:	16"
Pipe Sumps:	N/A
Piping Leak Detection:	None
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block
Containment Dimensions	N/A
Drain Mechanism:	Drain Valve
Containment Volume:	5086740
Drainage Outfall:	Oil Water Separator
Drain Security:	Yes
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 1996

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southwest	Probablity of Reaching Water:	Medium
Initital Receptor:	Outfall 002	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

If tank placed back into service: repair containment. tightness test piping, lock secondary containment drainage valve. Operations and maintenance on ATG system and CP system. Add HLCV

Notes:

Tank and associated lines have been cleaned and decommissioned.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	2000
		Next STI Inspection:	

AST 1996

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	201
Grid:	4E
Installation Year:	2000
Tank Type:	AST
Location:	Hobby Shop
Capacity:	500
Facility Organization:	Unknown
Contents:	Used Oil
Facility:	Unknown
Current Use:	Temporary Storage
Nearest Building:	201

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	Aggregate Finish
Construction Material:	Concrete/Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 4.5' x 3'4"
Tank Manufacturer:	ConVault
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None
Area Lighting:	Inadequate
Collision Barrier:	Inadequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	None
Gauge Manufacturer:	Krueger
HLA Manufacturer:	N/A
Gauge Model:	Unknown
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	Before tank is active
Tank LD Manfuacturer:	N/A
Pump Starter Control:	N/A
Tank LD Model:	N/A
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	N/A
Pipe Construction Material:	None
Pipe Condition:	N/A
Pipe Length:	N/A
Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A
Pipe Sumps:	N/A
Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	N/A
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 201

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southeast	Probablity of Reaching Water:	Low
Initital Receptor:	Outfall 002	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Close or remove tank.

Notes:

Tank marked "Empty" and is secured.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST 201

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID: 212
Grid: 3F
Installation Year: 1940
Tank Type: AST Bunkered
Location: Fuel Farm
Capacity: 50000
Facility Organization: Fuels Division
Contents: Diesel
Facility: Fuels Division
Current Use: Bulk Fuel Storage
Nearest Building: N/A

LABELING AND CODING

Tank ID Label: Yes
Capacity Label: Yes
Contents Label: Yes
Fill Port Color Coded: Yes

TANK INFORMATION

Construction Type: SW
Tank Condition: Good
Tank Color: Underground
Construction Material: Concrete
Tank Manifolded: Yes
Tank Shape: Vertical Cylinder
Corrosion Protection: Unknown
Tank Dimension: 33' x 8'
Tank Manufacturer: Unknown
Lining: Interior Polysulfide Coating
Model Number: Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection: None
Area Lighting: Adequate
Collision Barrier: Adequate
Liquid Level Gauge Type: None
HLA Type: None
Gauge Manufacturer: None
HLA Manufacturer: N/A
Gauge Model: N/A
HLA Model: N/A
Last Gauge Calibration: N/A
Tank Leak Detection: None
Next Gauge Calibration: N/A
Tank LD Manfuacturer: N/A
Pump Starter Control: Inaccessible to Unauthorized Personnel
Tank LD Model: N/A
Valves Surface Security: Yes
Spill Catchment: None

PIPING SYSTEM

Piping Exposure: Underground
Pipe Construction Material: SW Steel
Pipe Condition: Unknown
Pipe Length: Unknown
Pipe Corrosion Protection: None
Supply Pipe Diameter: 8"
Pipe Sumps: N/A
Piping Leak Detection: None
Return Pipe Diameter: Unknown
Pressurized Piping Line Leak Detectors: Unknown
Delivery System: Pressure
Annual Line Leak Detectors Testing: Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment: None
Containment Dimensions: N/A
Drain Mechanism: N/A
Containment Volume: N/A
Drainage Outfall: N/A
Drain Security: N/A
Loading/UnLoading Containment: Unknown
Loading/Unloading Containment Recommendations: None

Continuation of Tank ID: 212

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Medium
Initital Receptor:	mangrove adjacent to site	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

If made active provide ATG- high level alarm/HLCV, formal inspection of the tank and tightness test piping. Provide containment, & overfill catchment

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank is active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	2000
		Next STI Inspection:	Before tank is active

AST Bunkered 212 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	213	Grid:	3F
Installation Year:	1940		
Tank Type:	AST Bunkered	Location:	Fuel Farm
Capacity:	50000	Facility Organization:	Fuels Division
Contents:	Mogas	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Unknown
Tank Color:	Underground		
Construction Material:	Concrete	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Unknown
Tank Dimension:	33' x 8'	Tank Manufacturer:	Unknown
Lining:	Interior Polysulfide Coating	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	None	HLA Type:	None
Gauge Manufacturer:	None	HLA Manufacturer:	N/A
Gauge Model:	N/A	HLA Model:	N/A
Last Gauge Calibration:	N/A	Tank Leak Detection:	None
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	Cathodic Protection		
Supply Pipe Diameter:	8"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 213

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Medium
Initital Receptor:	mangrove adjacent to site	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

If made active provide ATG- high level alarm/HLCV, formal inspection of the tank and tightness test piping. Provide containment, & overfill catchment

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank is active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	2000
		Next STI Inspection:	Before tank is active

AST Bunkered 213 (2002)

Quick Find | | Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	214	Grid:	3F
Installation Year:	1940		
Tank Type:	AST Bunkered	Location:	Fuel Farm
Capacity:	248000	Facility Organization:	Fuels Division
Contents:	DFM	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Unknown
Tank Color:	Underground		
Construction Material:	Concrete	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Unknown
Tank Dimension:	56' x 13.7'	Tank Manufacturer:	Unknown
Lining:	Interior Latex Coating	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton ATG	HLA Manufacturer:	Barton
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	None		
Supply Pipe Diameter:	8"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 214

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Medium
Initital Receptor:	mangrove adjacent to site	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

If made active provide ATG- high level alarm/HLCV, formal inspection of the tank and tightness test piping. Provide containment, & overfill catchment

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank is active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Unknown
		Next STI Inspection:	Before tank is active

AST Bunkered 214 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	215
Grid:	3F
Installation Year:	1940
Tank Type:	AST Bunkered
Location:	Fuel Farm
Capacity:	245000
Facility Organization:	Fuels Division
Contents:	DFM
Facility:	Fuels Division
Current Use:	Bulk Fuel Storage
Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Yes
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Unknown
Tank Color:	Underground
Construction Material:	Concrete
Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder
Corrosion Protection:	Unknown
Tank Dimension:	56' x 13.7'
Tank Manufacturer:	Unknown
Lining:	Interior Latex Coating
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	None
HLA Type:	None
Gauge Manufacturer:	None
HLA Manufacturer:	N/A
Gauge Model:	N/A
HLA Model:	N/A
Last Gauge Calibration:	N/A
Tank Leak Detection:	None
Next Gauge Calibration:	N/A
Tank LD Manfuacturer:	N/A
Pump Starter Control:	Inaccessible to Unauthorized Personnel
Tank LD Model:	N/A
Valves Surface Security:	Yes
Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	None
Supply Pipe Diameter:	8"
Pipe Sumps:	N/A
Piping Leak Detection:	None
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	Unknown
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 215

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown
Initital Receptor:	mangrove adjacent to site
Intitial Conveyance:	Unknown
Probablity of Reaching Water:	Medium
Spill Equipment:	Unknown
Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

If made active provide ATG- high level alarm/HLCV, formal inspection of the tank and tightness test piping. Provide containment & overfill catchment

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	Unknown
Next Formal Piping Inspection:	Before tank is active
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	Unknown
Next STI Inspection:	Before tank is active

AST Bunkered 215 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	216	Grid:	4G
Installation Year:	1940		
Tank Type:	AST Bunkered	Location:	Fuel Farm
Capacity:	247000	Facility Organization:	Fuels Division
Contents:	DFM	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Unknown
Tank Color:	Underground		
Construction Material:	Concrete	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Unknown
Tank Dimension:	56' x 13.7'	Tank Manufacturer:	Unknown
Lining:	Interior Latex Coating	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	None	HLA Type:	None
Gauge Manufacturer:	None	HLA Manufacturer:	N/A
Gauge Model:	N/A	HLA Model:	N/A
Last Gauge Calibration:	N/A	Tank Leak Detection:	None
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	None		
Supply Pipe Diameter:	8"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 216

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown
Inititial Receptor:	mangrove adjacent to site
Intitial Conveyance:	Unknown
Probablity of Reaching Water:	Medium
Spill Equipment:	Unknown
Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

If made active provide ATG- high level alarm/HLCV, formal inspection of the tank and tightness test piping. Provide containment & overfill catchment

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	Unknown
Next Formal Piping Inspection:	Before tank is active
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	Unknown
Next STI Inspection:	Before tank is active

AST Bunkered 216 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	217	Grid:	4G
Installation Year:	1940		
Tank Type:	AST Bunkered	Location:	Fuel Farm
Capacity:	245000	Facility Organization:	Fuels Division
Contents:	DFM	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Unknown
Tank Color:	Underground		
Construction Material:	Concrete	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Unknown
Tank Dimension:	56' x 13.7'	Tank Manufacturer:	Unknown
Lining:	Interior Latex Coating	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	None	HLA Type:	None
Gauge Manufacturer:	None	HLA Manufacturer:	N/A
Gauge Model:	N/A	HLA Model:	N/A
Last Gauge Calibration:	N/A	Tank Leak Detection:	None
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	None		
Supply Pipe Diameter:	8"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 217

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown
Initital Receptor:	mangrove adjacent to site
Intitial Conveyance:	
Probablity of Reaching Water:	Medium
Spill Equipment:	Unknown
Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

If made active provide ATG- high level alarm/HLCV, formal inspection of the tank and tightness test piping. Provide containment & overfill catchment

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	Unknown
Next Formal Piping Inspection:	Before tank is active
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	Unknown
Next STI Inspection:	Before tank is active

AST Bunkered 217

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2191
Grid:	5G
Installation Year:	Unknown
Tank Type:	AST
Location:	Across from 2036
Capacity:	12000
Facility Organization:	Unknown
Contents:	Diesel
Facility:	Unknown
Current Use:	Temporary Storage
Nearest Building:	2191

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	Aggregate Finish
Construction Material:	Concrete/Steel
Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	33' x 9.5'
Tank Manufacturer:	ConVault
Lining:	Unknown
Model Number:	CM-12000 3SF

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	None
Gauge Manufacturer:	Krueger
HLA Manufacturer:	N/A
Gauge Model:	Unknown
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	N/A
Next Gauge Calibration:	Before tank is active
Tank LD Manfuacturer:	N/A
Pump Starter Control:	Next to tank
Tank LD Model:	N/A
Valves Surface Security:	No
Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	SW Steel
Pipe Condition:	Good
Pipe Length:	Unknown
Pipe Corrosion Protection:	None
Supply Pipe Diameter:	3"
Pipe Sumps:	N/A
Piping Leak Detection:	None
Return Pipe Diameter:	3"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	None
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 2191

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	High
Initital Receptor:	Bermed area with collection area	Spill Equipment:	Spill Kit
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Notes:

Tank is used on rare occasion for temporary storage of POL materials.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	

AST 2191

Quick Find:

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2232-INT	Grid:	5D
		Installation Year:	Unknown
Tank Type:	AST-INT	Location:	Bowling Alley
Capacity:	500	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Emergency Power Generation	Nearest Building:	2232

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Fair
		Tank Color:	Red
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Paint
Tank Dimension:	110" x 42" x 26"	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge	Area Lighting:	Inadequate
		Collision Barrier:	Adequate
Liquid Level Gauge Type:	Dial Gauge	HLA Type:	None
Gauge Manufacturer:	Unknown	HLA Manufacturer:	N/A
Gauge Model:	Unknown	HLA Model:	N/A
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	N/A
Pump Starter Control:	At generator	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	Rubber
Pipe Condition:	Fair	Pipe Length:	Unknown
		Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	Unknown	Pipe Sumps:	None
		Piping Leak Detection:	Visual Inspection
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	Plug	Containment Volume:	N/A
Drainage Outfall:	Ground	Drain Security:	No
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 2232-INT

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southwest	Probablity of Reaching Water:	Low
Initital Receptor:	Concrete bermed area	Spill Equipment:	None
Intitial Conveyance:	Sheet flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	

AST 2232-INT

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2234-INT	Grid:	5H
Installation Year:	Unknown		
Tank Type:	AST-INT	Location:	2234 Dry Dock
Capacity:	60	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Emergency Power Generation	Nearest Building:	2234

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Poor
Tank Color:	Green		
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Paint/Under Roof
Tank Dimension:	54" x 30" x 8"	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None	Area Lighting:	Inadequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	None	HLA Type:	None
Gauge Manufacturer:	N/A	HLA Manufacturer:	N/A
Gauge Model:	N/A	HLA Model:	N/A
Last Gauge Calibration:	N/A	Tank Leak Detection:	Visual inspection
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	N/A
Pump Starter Control:	At generator	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	Rubber
Pipe Condition:	Poor	Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material		
Supply Pipe Diameter:	Unknown	Pipe Sumps:	None
Piping Leak Detection:	Visual inspection		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	Plug	Containment Volume:	N/A
Drainage Outfall:	Ground	Drain Security:	No
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 2234-INT

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	North	Probablity of Reaching Water:	Moderate
Initital Receptor:	Ground	Spill Equipment:	None
Intitial Conveyance:	Sheet flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	

AST 2234-INT

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2270	Grid:	4F
Installation Year:	1988		
Tank Type:	AST	Location:	Fuel Farm
Capacity:	4200000	Facility Organization:	Fuels Division
Contents:	JP-5	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Good
Tank Color:	White		
Construction Material:	Welded Steel	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Impressed Current
Tank Dimension:	125' x 45'	Tank Manufacturer:	Unknown
Lining:	Yes	Model Number:	N/A

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton ATG	HLA Manufacturer:	Barton
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Inside Dike

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	Cathodic Protection		
Supply Pipe Diameter:	16"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Asphalt-lined berm	Containment Dimensions	N/A
Drain Mechanism:	Drain Valve	Containment Volume:	4566875
Drainage Outfall:	Ground outside dike	Drain Security:	Yes
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 2270

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Medium
Initital Receptor:	Outfall 002	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Before tank is active: Repair secondary containment, tightness test tank and piping, inspection and calibration of ATG system, inspection of Cathodic Protection system, and add HLCV.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Unknown
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank is active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	2002
		Next STI Inspection:	Before tank is active

AST 2270

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2271	Grid:	4F
		Installation Year:	1988
Tank Type:	AST	Location:	Fuel Farm
Capacity:	4200000	Facility Organization:	Fuels Division
Contents:	JP-5	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Good
		Tank Color:	White
Construction Material:	Welded Steel	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Impressed Current
Tank Dimension:	125' x 45'	Tank Manufacturer:	Unknown
Lining:	Yes	Model Number:	N/A

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm	Area Lighting:	Adequate
		Collision Barrier:	Adequate
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton ATG	HLA Manufacturer:	Barton
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Inside Dike

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
		Pipe Corrosion Protection:	Cathodic Protection
Supply Pipe Diameter:	16"	Pipe Sumps:	N/A
		Piping Leak Detection:	None
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Asphalt-lined berm	Containment Dimensions	N/A
Drain Mechanism:	Drain Valve	Containment Volume:	4465203
Drainage Outfall:	Ground outside dike	Drain Security:	Yes
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 2271

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Medium
Initital Receptor:	Outfall 002	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Before tank is active: Repair secondary containment, tightness test tank and piping, inspection and calibration of ATG system, inspection of Cathodic Protection system, and add HLCV.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Unknown
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank is active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	2002
		Next STI Inspection:	Before tank is active

AST 2271

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2272
Grid:	4F
Installation Year:	1988
Tank Type:	AST
Location:	Fuel Farm
Capacity:	4200000
Facility Organization:	Fuels Division
Contents:	JP-5
Facility:	Fuels Division
Current Use:	Bulk Fuel Storage
Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Yes
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Good
Tank Color:	White
Construction Material:	Welded Steel
Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder
Corrosion Protection:	Impressed Current
Tank Dimension:	125' x 45'
Tank Manufacturer:	Unknown
Lining:	Yes
Model Number:	N/A

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Automatic Tank Gauge
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton ATG
HLA Manufacturer:	Barton
Gauge Model:	Unknown
HLA Model:	Unknown
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active
Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel
Tank LD Model:	Unknown
Valves Surface Security:	Yes
Spill Catchment:	Inside Dike

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Cathodic Protection
Supply Pipe Diameter:	16"
Pipe Sumps:	N/A
Piping Leak Detection:	None
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Asphalt-lined berm
Containment Dimensions	N/A
Drain Mechanism:	Drain Valve
Containment Volume:	4465203
Drainage Outfall:	Ground outside dike
Drain Security:	Yes
Loading/UnLoading Containment:	Unknown
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 2272

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Medium
Inititial Receptor:	Outfall 002	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Before tank is active: Repair secondary containment, tightness test tank and piping, inspection and calibration of ATG system, inspection of Cathodic Protection system, and add HLCV.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Unknown
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank is active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	2002
		Next STI Inspection:	Before tank is active

AST 2272

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2273	Grid:	4F
Installation Year:	1988		
Tank Type:	AST	Location:	Fuel Farm
Capacity:	4267000	Facility Organization:	Fuels Division
Contents:	JP-5	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	2273

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Good
Tank Color:	White		
Construction Material:	Welded Steel	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Impressed Current
Tank Dimension:	125' x 45'	Tank Manufacturer:	Unknown
Lining:	Yes	Model Number:	N/A

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton ATG	HLA Manufacturer:	Barton
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Inside Dike

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	Cathodic Protection		
Supply Pipe Diameter:	16"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Asphalt-lined berm	Containment Dimensions	N/A
Drain Mechanism:	Drain Valve	Containment Volume:	4566875
Drainage Outfall:	Ground outside dike	Drain Security:	Yes
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 2273

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Medium
Initital Receptor:	Outfall 002	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Before tank is active: Repair secondary containment, tightness test tank and piping, inspection and calibration of ATG system, inspection of Cathodic Protection system, and add HLCV.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank is active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	2002
		Next STI Inspection:	Before tank is active

AST 2273

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2274	Grid:	4F
Installation Year:	1988		
Tank Type:	AST	Location:	Fuel Farm
Capacity:	4200000	Facility Organization:	Fuels Division
Contents:	JP-5	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Good
Tank Color:	White		
Construction Material:	Welded Steel	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Impressed Current
Tank Dimension:	125' x 45'	Tank Manufacturer:	Unknown
Lining:	Yes	Model Number:	N/A

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton ATG	HLA Manufacturer:	Barton
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Inside Dike

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	Cathodic Protection		
Supply Pipe Diameter:	16"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Asphalt-lined berm	Containment Dimensions	N/A
Drain Mechanism:	Drain Valve	Containment Volume:	4659135
Drainage Outfall:	Ground outside dike	Drain Security:	Yes
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 2274

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Medium
Initital Receptor:	Outfall 002	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Before tank is active: Repair secondary containment, tightness test tank and piping, inspection and calibration of ATG system, inspection of Cathodic Protection system, and add HLCV.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank is active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	2002
		Next STI Inspection:	Before tank is active

AST 2274

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2303-1
Grid:	5E
Installation Year:	1997
Tank Type:	AST
Location:	Navy Lodge
Capacity:	1000
Facility Organization:	Unknown
Contents:	Diesel
Facility:	Unknown
Current Use:	Heating
Nearest Building:	2303

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	No
Contents Label:	No
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	White
Construction Material:	Concrete/Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 5'8" x 4'4"
Tank Manufacturer:	ConVault
Lining:	30-mil HDPE
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm/Guillotine Valve
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Krueger
HLA Manufacturer:	Warrick Controls
Gauge Model:	Unknown
HLA Model:	DMS-572
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Warrick Controls
Next Gauge Calibration:	Before tank is active
Tank LD Manfuacturer:	Warrick Controls
Pump Starter Control:	Inaccessible to Unauthorized Personnel
Tank LD Model:	DMS-572
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	SW Copper
Pipe Condition:	Good
Pipe Length:	Unknown
Pipe Corrosion Protection:	DW
Supply Pipe Diameter:	1/4"
Pipe Sumps:	N/A
Piping Leak Detection:	None
Return Pipe Diameter:	1/4"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 2303-1

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Low
Initital Receptor:	Storm drain adjacent to site	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Close or remove tank

Notes:

Tank status marked inactive, but tank is still >3/4 capacity. Boiler system is not currently operational. Copper lines at tank are 1/2", transition to 1/4" at point where they go underground.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank is active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	Before tank is active

AST 2303-1

Quick Find

Status Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2339A	Grid:	6D
Installation Year:	1994		
Tank Type:	UST	Location:	NEX Gas Station
Capacity:	10000	Facility Organization:	Unknown
Contents:	Gasoline	Facility:	Unknown
Current Use:	Fueling - Motor Vehicle	Nearest Building:	2339

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Unknown
Tank Color:	Unknown		
Construction Material:	FRP	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	Unknown	Tank Manufacturer:	Unknown
Lining:	Unknown	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	N/A		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Veeder-Root	HLA Manufacturer:	Veeder-Root
Gauge Model:	TLS-350	HLA Model:	TLS-350
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Veeder-Root
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Veeder-Root
Pump Starter Control:	Inside Building	Tank LD Model:	TLS-350
Valves Surface Security:	Yes	Spill Catchment:	Unknown

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	Unknown
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	Unknown		
Supply Pipe Diameter:	Unknown	Pipe Sumps:	Unknown
Piping Leak Detection:	Unknown		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Unknown	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 2339A

DISPENSNG TANK SYSTEMS

Dispenser:	Single Product	VRS Stage 1:	Yes	Hose Retractor:	No
Number of Dispenser	1	VRS Stage 2:	Yes	Shear Valve:	Yes
Nozzles per Dispensers:	2	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	Yes
				Break Away Coupling:	Yes

SPILL RESPONSE INFORMATION

Initial Spill Direction	East	Probablity of Reaching Water:	Low
Initital Receptor:		Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	

Quick Find:

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2339B
Grid:	6D
Installation Year:	1994
Tank Type:	UST
Location:	NEX Gas Station
Capacity:	10000
Facility Organization:	Unknown
Contents:	Gasoline
Facility:	Unknown
Current Use:	Fueling - Motor Vehicle
Nearest Building:	2339

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	No
Contents Label:	No
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Unknown
Tank Color:	Unknown
Construction Material:	FRP
Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	Unknown
Tank Manufacturer:	Unknown
Lining:	Unknown
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	N/A
Liquid Level Gauge Type:	Automatic Tank Gauge
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Veeder-Root
HLA Manufacturer:	Veeder-Root
Gauge Model:	TLS-350
HLA Model:	TLS-350
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Veeder-Root
Next Gauge Calibration:	Before tank is active
Tank LD Manfuacturer:	Veeder-Root
Pump Starter Control:	Inside Building
Tank LD Model:	TLS-350
Valves Surface Security:	Yes
Spill Catchment:	Unknown

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	Unknown
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Unknown
Supply Pipe Diameter:	Unknown
Pipe Sumps:	Unknown
Piping Leak Detection:	Unknown
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Unknown
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 2339B

DISPENSNG TANK SYSTEMS

Dispenser:	Single Product
Number of Dispenser	1
Nozzles per Dispensers:	2
VRS Stage 1:	Yes
VRS Stage 2:	Yes
Emergency Shutoff:	N/A
Hose Retractor:	No
Shear Valve:	Yes
Nozzle Swivel Connector:	Yes
Break Away Coupling:	Yes

SPILL RESPONSE INFORMATION

Initial Spill Direction	East
Initital Receptor:	
Intitial Conveyance:	
Probablity of Reaching Water:	Low
Spill Equipment:	None
Ultimate Discharge	
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	
Next STI Inspection:	

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2339C
Grid:	6D
Installation Year:	1994
Tank Type:	UST
Location:	NEX Gas Station
Capacity:	10000
Facility Organization:	Unknown
Contents:	Gasoline
Facility:	Unknown
Current Use:	Fueling - Motor Vehicle
Nearest Building:	2339

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	No
Contents Label:	No
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Unknown
Tank Color:	Unknown
Construction Material:	FRP
Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	Unknown
Tank Manufacturer:	Unknown
Lining:	Unknown
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	N/A
Liquid Level Gauge Type:	Automatic Tank Gauge
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Veeder-Root
HLA Manufacturer:	Veeder-Root
Gauge Model:	TLS-350
HLA Model:	TLS-350
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Veeder-Root
Next Gauge Calibration:	Before tank is active
Tank LD Manfuacturer:	Veeder-Root
Pump Starter Control:	Inside Building
Tank LD Model:	TLS-350
Valves Surface Security:	Yes
Spill Catchment:	Unknown

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	Unknown
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Unknown
Supply Pipe Diameter:	Unknown
Pipe Sumps:	Unknown
Piping Leak Detection:	Unknown
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Unknown
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 2339C

DISPENSNG TANK SYSTEMS

Dispenser:	Single Product	VRS Stage 1:	Yes	Hose Retractor:	No
Number of Dispenser	1	VRS Stage 2:	Yes	Shear Valve:	Yes
Nozzles per Dispensers:	2	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	Yes
				Break Away Coupling:	Yes

SPILL RESPONSE INFORMATION

Initial Spill Direction	East	Probablity of Reaching Water:	Low
Initital Receptor:		Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	

UST 2339A, B, & C

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2339D
Grid:	6D
Installation Year:	1994
Tank Type:	AST
Location:	NEX Gas Station
Capacity:	500
Facility Organization:	Unknown
Contents:	Diesel
Facility:	Unknown
Current Use:	Emergency Power Generation
Nearest Building:	2339

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	No
Contents Label:	Yes
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Fair
Tank Color:	Yellow
Construction Material:	Steel
Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder
Corrosion Protection:	Painted
Tank Dimension:	64"x42"
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	None
Gauge Manufacturer:	Krueger
HLA Manufacturer:	N/A
Gauge Model:	Unknown
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	N/A
Tank LD Manfuacturer:	N/A
Pump Starter Control:	Adequate
Tank LD Model:	N/A
Valves Surface Security:	Yes
Spill Catchment:	Inside Dike

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	SW Copper
Pipe Condition:	Good
Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	3/4"
Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	3/4"
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block
Containment Dimensions	104"x70"x25"
Drain Mechanism:	Pump Out
Containment Volume:	536
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 2339D

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	East
Initital Receptor:	vacant lot adjacent to site
Intitial Conveyance:	
Probablity of Reaching Water:	Low
Spill Equipment:	None
Ultimate Discharge	
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

Before tank is active: increase capacity of containment, repair tank coating, replace level gauge.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	Never
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	Never
Next STI Inspection:	

AST 2339D

Quick Find | | Status | Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2339E	Grid:	6D	Installation Year:	1994
Tank Type:	UST	Location:	NEX Gas Station		
Capacity:	500	Facility Organization:	Unknown		
Contents:	Used Oil	Facility:	Unknown		
Current Use:	Used Lube Oil Consolidation	Nearest Building:	2339		

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Unknown	Tank Color:	Unknown
Construction Material:	Unknown	Tank Manifolded:	No		
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Corrosion Resistant Material		
Tank Dimension:	Unknown	Tank Manufacturer:	Unknown		
Lining:	Unknown	Model Number:	Unknown		

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-level Alarm	Area Lighting:	Adequate	Collision Barrier:	N/A
Liquid Level Gauge Type:	None	HLA Type:	Audible (Electronic)		
Gauge Manufacturer:	N/A	HLA Manufacturer:	Veeder-Root		
Gauge Model:	N/A	HLA Model:	TLS-350		
Last Gauge Calibration:	N/A	Tank Leak Detection:	Veeder-Root		
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Veeder-Root		
Pump Starter Control:	N/A	Tank LD Model:	TLS-350		
Valves Surface Security:	Yes	Spill Catchment:	Unknown		

PIPING SYSTEM

Piping Exposure:	N/A			Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A	Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A	Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A			Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	N/A			Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 2339E

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	East
Probablity of Reaching Water:	Low
Initital Receptor:	
Spill Equipment:	None
Intitial Conveyance:	
Ultimate Discharge	
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	
Next STI Inspection:	

UST 2339E

Quick Find | |

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2344-INT	Grid:	4G
Installation Year:	Unknown		
Tank Type:	AST-INT	Location:	2344
Capacity:	500	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Emergency Power Generation	Nearest Building:	2344

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Poor
Tank Color:	Red		
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Paint
Tank Dimension:	94" x 40" x 36"	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge	Area Lighting:	Inadequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Dial Gauge	HLA Type:	None
Gauge Manufacturer:	Unknown	HLA Manufacturer:	N/A
Gauge Model:	Unknown	HLA Model:	N/A
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	At generator	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	Rubber
Pipe Condition:	Fair	Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material		
Supply Pipe Diameter:	Unknown	Pipe Sumps:	None
Piping Leak Detection:	Visual Inspection		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	Plug	Containment Volume:	N/A
Drainage Outfall:	Ground	Drain Security:	No
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations			

Continuation of Tank ID: 2344-INT

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South
Probablity of Reaching Water:	Low
Initital Receptor:	Ground
Spill Equipment:	None
Intitial Conveyance:	Sheet flow
Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	
Next STI Inspection:	

AST 2344-INT

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2362-INT
Grid:	6D
Installation Year:	Unknown
Tank Type:	AST-INT
Location:	2362
Capacity:	458
Facility Organization:	Unknown
Contents:	Diesel
Facility:	Unknown
Current Use:	Emergency Power Generation
Nearest Building:	2362

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	Yes
Contents Label:	No
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	Black
Construction Material:	Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Paint
Tank Dimension:	100" x 48" x 24"
Tank Manufacturer:	Generac
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Dial Gauge
HLA Type:	None
Gauge Manufacturer:	Unknown
HLA Manufacturer:	N/A
Gauge Model:	Unknown
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	N/A
Tank LD Manfuacturer:	N/A
Pump Starter Control:	At generator
Tank LD Model:	N/A
Valves Surface Security:	Yes
Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	N/A
Pipe Construction Material:	Rubber
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	1/2"
Pipe Sumps:	N/A
Piping Leak Detection:	Visual Inspection
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	Plug
Containment Volume:	N/A
Drainage Outfall:	Ground
Drain Security:	No
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 2362-INT

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southwest	Probablity of Reaching Water:	Low
Initital Receptor:	Concrete ground at generator	Spill Equipment:	None
Intitial Conveyance:	Sheet flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Notes:

Tank 3/4 capacity

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	

AST 2362-INT

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2437
Grid:	4G
Installation Year:	1997
Tank Type:	AST
Location:	Fuel Farm
Capacity:	4200000
Facility Organization:	Fuels Division
Contents:	DFM
Facility:	Fuels Division
Current Use:	Bulk Fuel Storage
Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Yes
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Good
Tank Color:	Unknown
Construction Material:	Steel
Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder
Corrosion Protection:	Impressed Current
Tank Dimension:	138' x 40'
Tank Manufacturer:	Unknown
Lining:	Unknown
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm/Auto Shut-off
Area Lighting:	Adequate
Collision Barrier:	Unknown
Liquid Level Gauge Type:	Automatic Tank Gauge
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Visual Inspection
HLA Manufacturer:	Barton
Gauge Model:	Barton
HLA Model:	Unknown
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Unknown
Next Gauge Calibration:	Before tank is active
Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Inaccessible to Unauthorized Personnel
Tank LD Model:	Unknown
Valves Surface Security:	Yes
Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	None
Supply Pipe Diameter:	16"
Pipe Sumps:	N/A
Piping Leak Detection:	None
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block
Containment Dimensions	Unknown
Drain Mechanism:	Drop Inlet
Containment Volume:	5113000
Drainage Outfall:	Oil Water Separator
Drain Security:	N/A
Loading/UnLoading Containment:	Unknown
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 2437

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Medium
Initital Receptor:	Outfall 010	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Before tank is active: Operations and maintenance on the leak detection system, ATG, CP systems.

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	1994
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank is active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	Before tank is active

AST 2437

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	2439-INT
Grid:	6D
Installation Year:	Unknown
Tank Type:	AST-INT
Location:	2439
Capacity:	500
Facility Organization:	Unknown
Contents:	Diesel
Facility:	Unknown
Current Use:	Emergency Power Generation
Nearest Building:	2439

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	No
Contents Label:	No
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	Black
Construction Material:	Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Paint
Tank Dimension:	Unknown
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Dial Gauge
HLA Type:	None
Gauge Manufacturer:	Unknown
HLA Manufacturer:	N/A
Gauge Model:	Unknown
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	N/A
Tank LD Manfuacturer:	N/A
Pump Starter Control:	At Generator
Tank LD Model:	N/A
Valves Surface Security:	Yes
Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	N/A
Pipe Construction Material:	Rubber
Pipe Condition:	Good
Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	1/2"
Pipe Sumps:	
Piping Leak Detection:	Visual Inspection
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	Unknown
Drain Mechanism:	Plug
Containment Volume:	Unknown
Drainage Outfall:	Ground
Drain Security:	No
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 2439-INT

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	North	Probablity of Reaching Water:	Low
Initital Receptor:	Parking lot	Spill Equipment:	None
Intitial Conveyance:	Sheet flow	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	

AST 2439-INT

Quick Find

Status: Unknown

GENERAL SYSTEM INFORMATION

Tank ID:	3012
Grid:	N/A
Installation Year:	1997
Tank Type:	AST
Location:	Pico Del Este
Capacity:	10000
Facility Organization:	AFWTF
Contents:	Diesel
Facility:	AFWTF
Current Use:	Emergency Power Generation
Nearest Building:	3012

LABELING AND CODING

Tank ID Label:	Unknown
Capacity Label:	Unknown
Contents Label:	Unknown
Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	Gray
Construction Material:	Concrete/Steel
Tank Manifolded:	none
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	Unknown
Tank Manufacturer:	Unknown
Lining:	N/A
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	Unknown
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	Visible Gauge, High level alarm
Gauge Manufacturer:	Krueger
HLA Manufacturer:	Veeder-Root
Gauge Model:	Unknown
HLA Model:	TLS 350
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Veeder-Root
Next Gauge Calibration:	Unknown
Tank LD Manfuacturer:	Veeder-Root
Pump Starter Control:	Adequate
Tank LD Model:	TLS 350
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Underground
Pipe Construction Material:	DW Steel
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Unknown
Supply Pipe Diameter:	Unknown
Pipe Sumps:	Total Containment w/ sensor
Piping Leak Detection:	Unknown
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	Unknown
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 3012

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Low
Initital Receptor:	Unknown	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	Vacant area adjacent to site
Worst Case Discharge/Rate of Flow:			

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Unknown
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST 3012 (2002)

Quick Find

Status: Unknown

GENERAL SYSTEM INFORMATION

Tank ID:	3018
Grid:	N/A
Installation Year:	1997
Tank Type:	AST
Location:	Pico Del Este
Capacity:	1000
Facility Organization:	AFWTF
Contents:	Diesel
Facility:	AFWTF
Current Use:	Emergency Power Generation
Nearest Building:	3018

LABELING AND CODING

Tank ID Label:	Unknown
Capacity Label:	Unknown
Contents Label:	Unknown
Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Poor
Tank Color:	Gray
Construction Material:	Concrete/Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	Unknown
Tank Manufacturer:	Unknown
Lining:	N/A
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	Unknown
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	Visible Gauge
Gauge Manufacturer:	Unknown
HLA Manufacturer:	Veeder-Root
Gauge Model:	Unknown
HLA Model:	TLS 350
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Veeder-Root
Next Gauge Calibration:	Unknown
Tank LD Manfuacturer:	Veeder-Root
Pump Starter Control:	Adequate
Tank LD Model:	TLS 350
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Paint
Supply Pipe Diameter:	Unknown
Pipe Sumps:	N/A
Piping Leak Detection:	Visual Inspection
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	N/A
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	Unknown
Loading/Unloading Containment Recommendations	

Continuation of Tank ID: 3018

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Low
Initital Receptor:	Unknown	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	Vacant area adjacent to site
Worst Case Discharge/Rate of Flow:			

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST 3018 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	381	Grid:	4F
Installation Year:	1955		
Tank Type:	AST Bunkered	Location:	Fuel Farm
Capacity:	1180000	Facility Organization:	Fuels Division
Contents:	JP-5	Facility:	Fuels Division
Current Use:	Aircraft Hydrant System	Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Unknown	Capacity Label:	Unknown
Contents Label:	Unknown	Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Poor
Tank Color:	Underground		
Construction Material:	Welded Steel	Tank Manifolded:	No
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Unknown
Tank Dimension:	100' x 20'	Tank Manufacturer:	Unknown
Lining:	Interior Polyurethane Coating	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton	HLA Manufacturer:	Barton
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	Cathodic Protection		
Supply Pipe Diameter:	12"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 381

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southeast	Probablity of Reaching Water:	Medium
Initital Receptor:		Spill Equipment:	Unknown
Intitial Conveyance:		Ultimate Discharge	
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Before tank active: tightness test tank and piping, Operations and maintenance on the ATG & CP. Add HLCV

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	1994
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before Active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	03/2001
		Next STI Inspection:	Before Active

AST Bunkered 381 (2002)

Quick Find |

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	519
Grid:	6B
Installation Year:	2000
Tank Type:	AST
Location:	Building 519, Bundy
Capacity:	250
Facility Organization:	Unknown
Contents:	Diesel
Facility:	Unknown
Current Use:	Emergency Power Generation
Nearest Building:	519

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	White
Construction Material:	Concrete/Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	7' x 3'9" x 3'3"
Tank Manufacturer:	ConVault
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	None
Gauge Manufacturer:	Krueger
HLA Manufacturer:	N/A
Gauge Model:	Unknown
HLA Model:	N/A
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Interstitial monitor Pop-up
Next Gauge Calibration:	N/A
Tank LD Manfuacturer:	Krueger
Pump Starter Control:	Inaccessible to Unauthorized Personnel
Tank LD Model:	Unknown
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	Rubber
Pipe Condition:	Fair
Pipe Length:	12'
Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	1/2"
Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	N/A
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	None
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 519

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Southwest	Probablity of Reaching Water:	Low
Initital Receptor:	Ground	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Close/Remove tank.

Notes:

Most of generator electric components have been vandalized and left inoperable.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST 519

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	82	Grid:	4G
Installation Year:	1940		
Tank Type:	AST Bunkered	Location:	Fuel Farm
Capacity:	2115000	Facility Organization:	Fuels Division
Contents:	DFM	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	N/A

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Unknown
Tank Color:	Unknown		
Construction Material:	Concrete	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	None
Tank Dimension:	135' x 20'	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm/Auto Shut-off	Area Lighting:	Adequate
Collision Barrier:	N/A		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Unknown
Gauge Manufacturer:	Unknown	HLA Manufacturer:	Unknown
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Unknown
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	Cathodic Protection		
Supply Pipe Diameter:	Unknown	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 82

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Medium
Initital Receptor:	Unknown	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	Unknown
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Before tank is active: provide secondary containment, overfill catchment, and automatic overfill prevention. Operations and maintenance on ATG and High level alarms

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	2001 (missing)
		Next STI Inspection:	Before tank active

AST Bunkered 82 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	83	Grid:	4G
		Installation Year:	1940
Tank Type:	AST Bunkered	Location:	Fuel Farm
Capacity:	1157000	Facility Organization:	Fuels Division
Contents:	DFM	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	1982

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Unknown
		Tank Color:	Unknown
Construction Material:	Concrete	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Unknown
Tank Dimension:	100' x 20'	Tank Manufacturer:	Unknown
Lining:	Polyurethane lining	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm	Area Lighting:	Adequate
		Collision Barrier:	N/A
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton	HLA Manufacturer:	Barton
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Unknown
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
		Pipe Corrosion Protection:	None
Supply Pipe Diameter:	12"	Pipe Sumps:	N/A
		Piping Leak Detection:	None
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 83

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Medium
Initital Receptor:	Unknown	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	Unknown
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Before tank is active: provide secondary containment, overfill catchment, and automatic overfill prevention. Operations and maintenance on ATG and High level alarms

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	2001 (missing)
		Next STI Inspection:	Before tank active

AST Bunkered 83 (2002)

Quick Find

Status Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	84	Grid:	4G
Installation Year:	1944		
Tank Type:	AST Bunkered	Location:	Fuel Farm
Capacity:	585000	Facility Organization:	Fuels Division
Contents:	JP-5	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	1982

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Unknown
Tank Color:	Unknown		
Construction Material:	Concrete/Steel	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Unknown
Tank Dimension:	88' x 13'	Tank Manufacturer:	Unknown
Lining:	Polyurethane lining	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	N/A		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton	HLA Manufacturer:	Barton
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	None		
Supply Pipe Diameter:	8"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 84

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Unknown
Initital Receptor:	Unknown	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	Unknown
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Before tank is active: provide secondary containment, overfill catchment, and automatic overfill prevention. Operations and maintenance on ATG and High level alarms

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	2001
		Next STI Inspection:	Before tank active

AST Bunkered 84 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	85	Grid:	5G
Installation Year:	1944		
Tank Type:	AST Bunkered	Location:	Fuel Farm
Capacity:	1134000	Facility Organization:	Fuels Division
Contents:	JP-5	Facility:	Fuels Division
Current Use:	Bulk Fuel Storage	Nearest Building:	1982

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	Yes

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Unknown
Tank Color:	Unknown		
Construction Material:	Welded Steel	Tank Manifolded:	Yes
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Unknown
Tank Dimension:	100' x 20'	Tank Manufacturer:	Unknown
Lining:	Polyurethane lining	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm/Auto Shut-off	Area Lighting:	Adequate
Collision Barrier:	N/A		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Barton	HLA Manufacturer:	Barton
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Barton
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Barton
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	None

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	None		
Supply Pipe Diameter:	12"	Pipe Sumps:	N/A
Piping Leak Detection:	None		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 85

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	High
Initital Receptor:	Unknown	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	Unknown
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Before tank is active: provide secondary containment, overfill catchment, and automatic overfill prevention. Operations and maintenance on ATG and High level alarms

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	Before tank active
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	2001
		Next STI Inspection:	Before tank active

AST Bunkered 85

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	BOWTS-1	Grid:	5G
		Installation Year:	2000
Tank Type:	AST	Location:	BOWTS
Capacity:	50000	Facility Organization:	Unknown
Contents:	Oily Waste Water	Facility:	Unknown
Current Use:	Water Treatment	Nearest Building:	2252

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Good
		Tank Color:	White
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Painted
Tank Dimension:	20' x 15'	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate
		Collision Barrier:	Adequate
Liquid Level Gauge Type:	Automatic Tank Gauge/Sight Glass	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Unknown	HLA Manufacturer:	Unknown
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Unknown
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Adequate	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Inside Dike

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	Unknown
Pipe Corrosion Protection:	Paint		
Supply Pipe Diameter:	Unknown	Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	80' x 50' x 23"
Drain Mechanism:	Pump Out	Containment Volume:	57,000
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: BOWTS-1

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South
Initital Receptor:	Inside diked area
Intitial Conveyance:	
Probablity of Reaching Water:	High
Spill Equipment:	None
Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	Never
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	Never
Next STI Inspection:	

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	BOWTS-2	Grid:	5G
		Installation Year:	2000
Tank Type:	AST	Location:	BOWTS
Capacity:	50000	Facility Organization:	Unknown
Contents:	Oily Waste Water	Facility:	Unknown
Current Use:	Water Treatment	Nearest Building:	2252

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Good
		Tank Color:	White
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Painted
Tank Dimension:	20' x 15'	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate
		Collision Barrier:	Adequate
Liquid Level Gauge Type:	Automatic Tank Gauge/Sight Glass	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Unknown	HLA Manufacturer:	Unknown
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Unknown
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Adequate	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Inside Dike

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	Unknown
		Pipe Corrosion Protection:	Paint
Supply Pipe Diameter:	Unknown	Pipe Sumps:	N/A
		Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	80' x 50' x 23"
Drain Mechanism:	Pump Out	Containment Volume:	57,000
Drainage Outfall:	N/A	Drain Security:	N/A

Loading/UnLoading Containment: None

Loading/Unloading Containment Recommendations: None

Continuation of Tank ID: BOWTS-2

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	High
Initital Receptor:	Inside diked area	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	N/A
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

ASTs BOWTS 1&2

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	BOWTS-3	Grid:	5G	Installation Year:	2000
Tank Type:	AST	Location:	BOWTS		
Capacity:	1000	Facility Organization:	Unknown		
Contents:	Used Oil	Facility:	Unknown		
Current Use:	Water Treatment	Nearest Building:	2252		

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Good	Tank Color:	Gray
Construction Material:	Steel	Tank Manifolded:	No		
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Painted		
Tank Dimension:	8' x 6'	Tank Manufacturer:	Unknown		
Lining:	None	Model Number:	Unknown		

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate	Collision Barrier:	Adequate
Liquid Level Gauge Type:	Sight Glass	HLA Type:	Audible (Electronic)		
Gauge Manufacturer:	Unknown	HLA Manufacturer:	Unknown		
Gauge Model:	Unknown	HLA Model:	Unknown		
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Unknown		
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Unknown		
Pump Starter Control:	Adequate	Tank LD Model:	Unknown		
Valves Surface Security:	Yes	Spill Catchment:	Inside Dike		

PIPING SYSTEM

Piping Exposure:	Aboveground			Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	Unknown	Pipe Corrosion Protection:	Paint
Supply Pipe Diameter:	Unknown	Pipe Sumps:	N/A	Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	Unknown			Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure			Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	80' x 50' x 23"
Drain Mechanism:	Pump Out	Containment Volume:	57,000
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: BOWTS-3

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	High
Initital Receptor:	Inside diked area	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	BOWTS-4	Grid:	5G
Installation Year:	2000		
Tank Type:	AST	Location:	BOWTS
Capacity:	1000	Facility Organization:	Unknown
Contents:	Used Oil	Facility:	Unknown
Current Use:	Water Treatment	Nearest Building:	2252

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Good
Tank Color:	Gray		
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Painted
Tank Dimension:	8' x 6'	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Sight Glass	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Unknown	HLA Manufacturer:	Unknown
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Unknown
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Adequate	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Inside Dike

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	Unknown
Pipe Corrosion Protection:	Paint		
Supply Pipe Diameter:	Unknown	Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	80' x 50' x 23"
Drain Mechanism:	Pump Out	Containment Volume:	57,000
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: BOWTS-4

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	High
Initital Receptor:	Inside diked area	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	BOWTS-5	Grid:	5G
Installation Year:	2000		
Tank Type:	AST	Location:	BOWTS
Capacity:	1000	Facility Organization:	Unknown
Contents:	Used Oil	Facility:	Unknown
Current Use:	Water Treatment	Nearest Building:	2252

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Good
Tank Color:	Gray		
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Vertical Cylinder	Corrosion Protection:	Painted
Tank Dimension:	8' x 6'	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Sight Glass	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Unknown	HLA Manufacturer:	Unknown
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Unknown
Next Gauge Calibration:	Before tank is active	Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Adequate	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Inside Dike

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	Unknown
Pipe Corrosion Protection:	Paint		
Supply Pipe Diameter:	Unknown	Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	Unknown
Delivery System:	Pressure	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	80' x 50' x 23"
Drain Mechanism:	Pump Out	Containment Volume:	57,000
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: BOWTS-5

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	High
Initital Receptor:	Inside diked area	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

ASTs BOWTS 3-5

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	ROTHR-1
Grid:	N/A
Installation Year:	2000
Tank Type:	AST
Location:	ROTHR
Capacity:	300
Facility Organization:	AFWTF
Contents:	Diesel
Facility:	AFWTF
Current Use:	Fueling - Motor Vehicle
Nearest Building:	ROTHR

LABELING AND CODING

Tank ID Label:	Unknown
Capacity Label:	Unknown
Contents Label:	Unknown
Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	White
Construction Material:	DW Steel
Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder
Corrosion Protection:	Painted
Tank Dimension:	55" x 48"
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Unknown
Area Lighting:	Adequate
Collision Barrier:	Unknown
Liquid Level Gauge Type:	Unknown
HLA Type:	Unknown
Gauge Manufacturer:	Unknown
HLA Manufacturer:	Unknown
Gauge Model:	Unknown
HLA Model:	Unknown
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Unknown
Next Gauge Calibration:	Unknown
Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Unknown
Tank LD Model:	Unknown
Valves Surface Security:	Unknown
Spill Catchment:	Unknown

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	Rubber
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	Unknown
Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	Unknown
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: ROTHR-1

DISPENSNG TANK SYSTEMS

Dispenser:	Unknown	VRS Stage 1:	Unknown	Hose Retractor:	Unknown
Number of Dispenser	Unknown	VRS Stage 2:	Unknown	Shear Valve:	Unknown
Nozzles per Dispensers:	Unknown	Emergency Shutoff:	Unknown	Nozzle Swivel Connector:	Unknown
				Break Away Coupling:	Unknown

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Low
Initital Receptor:	Unknown	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	Unknown
Worst Case Discharge/Rate of Flow:			

BMP Recommendations

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST ROTHR 1 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	ROTHR-2	Grid:	N/A
Installation Year:	2001		
Tank Type:	AST	Location:	ROTHR
Capacity:	300	Facility Organization:	AFWTF
Contents:	Diesel	Facility:	AFWTF
Current Use:	Fueling - Motor Vehicle	Nearest Building:	ROTHR

LABELING AND CODING

Tank ID Label:	Unknown	Capacity Label:	Unknown
Contents Label:	Unknown	Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	White		
Construction Material:	DW Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Painted
Tank Dimension:	55" x 48"	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Unknown	Area Lighting:	Adequate
Collision Barrier:	Unknown		
Liquid Level Gauge Type:	Unknown	HLA Type:	Unknown
Gauge Manufacturer:	Unknown	HLA Manufacturer:	Unknown
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Unknown
Next Gauge Calibration:	Unknown	Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Unknown	Tank LD Model:	Unknown
Valves Surface Security:	Unknown	Spill Catchment:	Unknown

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	Rubber
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material		
Supply Pipe Diameter:	Unknown	Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	Unknown		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: ROTHR-2

DISPENSNG TANK SYSTEMS

Dispenser:	Unknown
Number of Dispenser	Unknown
Nozzles per Dispensers:	Unknown
VRS Stage 1:	Unknown
VRS Stage 2:	Unknown
Emergency Shutoff:	Unknown
Hose Retractor:	Unknown
Shear Valve:	Unknown
Nozzle Swivel Connector:	Unknown
Break Away Coupling:	Unknown

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown
Probablity of Reaching Water:	Low
Initital Receptor:	Unknown
Spill Equipment:	Unknown
Intitial Conveyance:	Unknown
Ultimate Discharge	Unknown
Worst Case Discharge/Rate of Flow:	

BMP Recommendations

Replace missing fittings

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	Never
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	Never
Next STI Inspection:	

AST ROTHR 2 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	ROTHR-3
Grid:	N/A
Installation Year:	2001
Tank Type:	AST
Location:	ROTHR
Capacity:	250
Facility Organization:	AFWTF
Contents:	Diesel
Facility:	AFWTF
Current Use:	Emergency Power Generation
Nearest Building:	ROTHR

LABELING AND CODING

Tank ID Label:	Unknown
Capacity Label:	Unknown
Contents Label:	Unknown
Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	SW
Tank Condition:	Good
Tank Color:	Red
Construction Material:	Steel
Tank Manifolded:	No
Tank Shape:	Dike Tank
Corrosion Protection:	Painted
Tank Dimension:	62" x 36"
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Unknown
Area Lighting:	Adequate
Collision Barrier:	Unknown
Liquid Level Gauge Type:	Unknown
HLA Type:	Unknown
Gauge Manufacturer:	Unknown
HLA Manufacturer:	Unknown
Gauge Model:	Unknown
HLA Model:	Unknown
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Unknown
Next Gauge Calibration:	Unknown
Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Unknown
Tank LD Model:	Unknown
Valves Surface Security:	Unknown
Spill Catchment:	Unknown

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	SW Steel
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Paint
Supply Pipe Diameter:	Unknown
Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Dike Tank
Containment Dimensions	7' x 4' x 1'8"
Drain Mechanism:	None
Containment Volume:	330
Drainage Outfall:	None
Drain Security:	N/A
Loading/UnLoading Containment:	Unknown
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: ROTHR-3

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Low
Initital Receptor:	Unknown	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	Unknown
Worst Case Discharge/Rate of Flow:			

BMP Recommendations

None

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST ROTHR 3 (2002)

Quick Find

Status: Inactive

GENERAL SYSTEM INFORMATION

Tank ID:	ROTHR-4
Grid:	N/A
Installation Year:	2001
Tank Type:	AST
Location:	ROTHR
Capacity:	250
Facility Organization:	AFWTF
Contents:	Diesel
Facility:	AFWTF
Current Use:	Emergency Power Generation
Nearest Building:	ROTHR

LABELING AND CODING

Tank ID Label:	Unknown
Capacity Label:	Unknown
Contents Label:	Unknown
Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	White
Construction Material:	DW Steel
Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder
Corrosion Protection:	Painted
Tank Dimension:	7' x 4' x 3.4'
Tank Manufacturer:	Unknown
Lining:	None
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Unknown
Area Lighting:	Adequate
Collision Barrier:	Unknown
Liquid Level Gauge Type:	Unknown
HLA Type:	Unknown
Gauge Manufacturer:	Unknown
HLA Manufacturer:	Unknown
Gauge Model:	Unknown
HLA Model:	Unknown
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Unknown
Next Gauge Calibration:	Unknown
Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Unknown
Tank LD Model:	Unknown
Valves Surface Security:	Unknown
Spill Catchment:	Unknown

PIPING SYSTEM

Piping Exposure:	Aboveground
Pipe Construction Material:	Rubber
Pipe Condition:	Unknown
Pipe Length:	Unknown
Pipe Corrosion Protection:	Corrosion Resistant Material
Supply Pipe Diameter:	Unknown
Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	Unknown
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Hand pump
Annual Line Leak Detectors Testing:	Unknown

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	Unknown
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: ROTHR-4

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown	Probablity of Reaching Water:	Low
Initital Receptor:	Unknown	Spill Equipment:	Unknown
Intitial Conveyance:	Unknown	Ultimate Discharge	Unknown
Worst Case Discharge/Rate of Flow:			

BMP Recommendations

Provide marking for oil type

Notes:

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST ROTHR 4 (2002)

Closed Tanks

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	1211	Grid:	6C
Installation Year:	2001		
Tank Type:	AST	Location:	Golf Course
Capacity:	5000	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Fueling - Motor Vehicle	Nearest Building:	1211

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	Aggregate Finish		
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	207" x 110"	Tank Manufacturer:	ConVault
Lining:	N/A	Model Number:	

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High-Level Alarm - Visible Gauge	Area Lighting:	Adequate
Collision Barrier:	Inadequate		
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	High-Level Alarm - Visible Gauge
Gauge Manufacturer:	Krueger	HLA Manufacturer:	Warrick Controls
Gauge Model:	Unknown	HLA Model:	DLS-573
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Warrick Controls
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Warrick Controls
Pump Starter Control:	Locked	Tank LD Model:	DLS-573
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	Unknown
Pipe Corrosion Protection:	None		
Supply Pipe Diameter:	1.5"	Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	1.5"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	None		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 1211

DISPENSNG TANK SYSTEMS

Dispenser:	Single Product	VRS Stage 1:	Yes	Hose Retractor:	No
Number of Dispenser	1	VRS Stage 2:	No	Shear Valve:	No
Nozzles per Dispensers:	1	Emergency Shutoff:	Yes	Nozzle Swivel Connector:	Yes
				Break Away Coupling:	No

SPILL RESPONSE INFORMATION

Initial Spill Direction	Northeast	Probablity of Reaching Water:	Moderate
Initital Receptor:	Ground	Spill Equipment:	None
Intitial Conveyance:	Sheet flow	Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST 1211

Quick Find

Status Closed

GENERAL SYSTEM INFORMATION

Tank ID:	1211A/B	Grid:	6C
		Installation Year:	1997-1998
Tank Type:	AST	Location:	Golf Course
Capacity:	500/500	Facility Organization:	Unknown
Contents:	Diesel/Mogas	Facility:	Unknown
Current Use:	Fueling - Motor Vehicle	Nearest Building:	1211

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
		Tank Color:	Aggregate Finish
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 5'8" x 4'4"	Tank Manufacturer:	ConVault
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High Level Alarm - Visual Gauge	Area Lighting:	Adequate
		Collision Barrier:	Inadequate
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	High Level Alarm - Visual Gauge
Gauge Manufacturer:	Krueger	HLA Manufacturer:	Warrick Controls
Gauge Model:	Unknown	HLA Model:	DLS-573
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Warrick Controls
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Warrick Controls
Pump Starter Control:	Locked Whenever Off	Tank LD Model:	DLS-573
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	SW Steel
Pipe Condition:	Good	Pipe Length:	Unknown
		Pipe Corrosion Protection:	None
Supply Pipe Diameter:	1.5"	Pipe Sumps:	N/A
		Piping Leak Detection:	Visible Inspection
Return Pipe Diameter:	1.5"	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 1211A/B

DISPENSNG TANK SYSTEMS

Dispenser:	Single Product (On Tank)
Number of Dispenser	2
Nozzles per Dispensers:	1
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	Yes
Hose Retractor:	No
Shear Valve:	No
Nozzle Swivel Connector:	Yes
Break Away Coupling:	No

SPILL RESPONSE INFORMATION

Initial Spill Direction	Northeast
Initital Receptor:	Ground
Intitial Conveyance:	Sheet Flow
Probablity of Reaching Water:	Moderate
Spill Equipment:	None
Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	N/A
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	N/A
Next STI Inspection:	

AST 1211 A/B

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID: 161
Grid: 5D
Installation Year: 1999
Tank Type: AST
Location: North Delicias Radar
Capacity: 500
Facility Organization: Unknown
Contents: Diesel
Facility: Unknown
Current Use: Emergency Power Generation
Nearest Building: 161

LABELING AND CODING

Tank ID Label: No
Capacity Label: Yes
Contents Label: Yes
Fill Port Color Coded: No

TANK INFORMATION

Construction Type: DW
Tank Condition: Good
Tank Color: Aggregate Finish
Construction Material: Concrete/Steel
Tank Manifolded: No
Tank Shape: Rectangular
Corrosion Protection: Corrosion Resistant Material
Tank Dimension: 11' x 4.5' x 3'4"
Tank Manufacturer: ConVault
Lining: None
Model Number: Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection: Visible Gauge, High-Level Alarm
Area Lighting: Adequate
Collision Barrier: Inadequate
Liquid Level Gauge Type: Automatic Tank Gauge
HLA Type: High-Level Alarm
Gauge Manufacturer: Warrick Controls
HLA Manufacturer: Warrick Controls
Gauge Model: Unknown
HLA Model: Unknown
Last Gauge Calibration: Unknown
Tank Leak Detection: Warrick Controls
Next Gauge Calibration: N/A
Tank LD Manfuacturer: Unknown
Pump Starter Control: Inaccessible to Unauthorized Personnel
Tank LD Model: Unknown
Valves Surface Security: Yes
Spill Catchment: Overfill Containment

PIPING SYSTEM

Piping Exposure: N/A
Pipe Construction Material: N/A
Pipe Condition: N/A
Pipe Length: N/A
Pipe Corrosion Protection: N/A
Supply Pipe Diameter: N/A
Pipe Sumps: N/A
Piping Leak Detection: N/A
Return Pipe Diameter: N/A
Pressurized Piping Line Leak Detectors: N/A
Delivery System: N/A
Annual Line Leak Detectors Testing: N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment: DW
Containment Dimensions: N/A
Drain Mechanism: N/A
Containment Volume: N/A
Drainage Outfall: N/A
Drain Security: N/A
Loading/UnLoading Containment: N/A
Loading/Unloading Containment Recommendations: None

Continuation of Tank ID: 161

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction		Probablity of Reaching Water:	Low
Initital Receptor:	Vacant area adjacent to site	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	N/A
		Next STI Inspection:	

AST 161

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	1686	Grid:	6B
Installation Year:	1996		
Tank Type:	UST	Location:	FBI Building
Capacity:	10000	Facility Organization:	FBI Building
Contents:	JP-5 Fuel	Facility:	FBI Building
Current Use:	Emergency Power Generation	Nearest Building:	1686

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Unknown
Tank Color:	Unknown		
Construction Material:	FRP	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Unknown
Tank Dimension:	Unknown	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Unknown	Area Lighting:	Adequate
Collision Barrier:	N/A		
Liquid Level Gauge Type:	Unknown	HLA Type:	Unknown
Gauge Manufacturer:	Unknown	HLA Manufacturer:	Unknown
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Unknown
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Unknown	Tank LD Model:	Unknown
Valves Surface Security:	Unknown	Spill Catchment:	Unknown

PIPING SYSTEM

Piping Exposure:	Underground	Pipe Construction Material:	Unknown
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	Unknown		
Supply Pipe Diameter:	Unknown	Pipe Sumps:	
Piping Leak Detection:	Unknown		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 1686

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction		Probablity of Reaching Water:	Moderate
Initital Receptor:		Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 280.70(b).

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	

UST 1686

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	1729	Grid:	4G
		Installation Year:	1997
Tank Type:	AST	Location:	Above Tow-way
Capacity:	2000	Facility Organization:	AFWTF
Contents:	Diesel	Facility:	AFWTF
Current Use:	Emergency Power Generation	Nearest Building:	1729

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
		Tank Color:	Gray
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' 3" x 8' x 5'6"	Tank Manufacturer:	Phoenix
Lining:	30-mil HDPE	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Whistle Vent, High-Level Alarm, Visible Gauge	Area Lighting:	Adequate
		Collision Barrier:	Inadequate
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Veeder-Root	HLA Manufacturer:	Veeder-Root
Gauge Model:	TLS-350	HLA Model:	TLS-350
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Veeder-Root
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Veeder-Root
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	TLS-350
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground/protected	Pipe Construction Material:	SW Steel
Pipe Condition:	N/A	Pipe Length:	N/A
		Pipe Corrosion Protection:	Paint
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
		Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 1729

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction		Probablity of Reaching Water:	Low
Initital Receptor:	Outfall NR-030	Spill Equipment:	
Intitial Conveyance:		Ultimate Discharge	
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Unknown
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	N/A
		Next STI Inspection:	


PERMANENTLY
CLOSED AST
PER 40 CFR 112.2
BLDG # 1729
2000
DIESEL

AST 1729

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	1796A	Grid:	5D
		Installation Year:	1997
Tank Type:	AST	Location:	NEX Mall
Capacity:	250	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Boilers	Nearest Building:	1796

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
		Tank Color:	Off White
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	7'8" x 3'9" x 3'3"	Tank Manufacturer:	ConVault
Lining:	None	Model Number:	

SPILL AND OVERFILL PROTECTION

Overfill Protection:	High Level Alarm/Guillotine Valve	Area Lighting:	Adequate
		Collision Barrier:	Adequate
Liquid Level Gauge Type:	None	HLA Type:	Visual
Gauge Manufacturer:	N/A	HLA Manufacturer:	Soil Sentry
Gauge Model:	N/A	HLA Model:	TLM-830
Last Gauge Calibration:	N/A	Tank Leak Detection:	Soil Sentry
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Soil Sentry
Pump Starter Control:	N/A	Tank LD Model:	TLM-830
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
		Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
		Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 1796A

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction		Probablity of Reaching Water:	Low
Initital Receptor:	Drainage Ditch	Spill Equipment:	None
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	N/A
		Next STI Inspection:	

AST 1796 A

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	1796B	Grid:	5E
		Installation Year:	Unknown
Tank Type:	AST	Location:	NEX Mall
Capacity:	500	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Emergency Power Generation	Nearest Building:	1796

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
		Tank Color:	Aggregate Finish
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Painted
Tank Dimension:	11' x 4'6" x 3'4"	Tank Manufacturer:	ConVault
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None	Area Lighting:	Adequate
		Collision Barrier:	Inadequate
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	None
Gauge Manufacturer:	Krueger	HLA Manufacturer:	N/A
Gauge Model:	Unknown	HLA Model:	N/A
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	N/A	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
		Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
		Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	None	Containment Dimensions	N/A
Drain Mechanism:	None	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 1796B

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction		Probablity of Reaching Water:	Low
Initital Receptor:	Drainage Ditch	Spill Equipment:	
Intitial Conveyance:		Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	never
		Next STI Inspection:	


PERMANENTLY
CLOSED AST
PER 40 CFR 112.2
BLDG # 1796
DIESEL
COMBUSTIBLE
NO SMOKING
0
2
0

AST 1796 B

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	1972	Grid:	7E	Installation Year:	1997
Tank Type:	AST	Location:	Lift Station at Pt. Cascajo		
Capacity:	250	Facility Organization:	Unknown		
Contents:	Diesel	Facility:	Unknown		
Current Use:	Emergency Power Generation	Nearest Building:	1972		

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good	Tank Color:	Off White
Construction Material:	Concrete/Steel	Tank Manifolded:	No		
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material		
Tank Dimension:	7'8" x 3'9" x 3'3"	Tank Manufacturer:	ConVault		
Lining:	30-mil HDPE	Model Number:	Unknown		

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Whistle Vent - High-Level Alarm - Guillotine V	Area Lighting:	None	Collision Barrier:	Inadequate
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	Audible (Electronic)		
Gauge Manufacturer:	Krueger	HLA Manufacturer:	Veeder-Root		
Gauge Model:	Unknown	HLA Model:	TLM-830		
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Veeder-Root		
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Veeder-Root		
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	TLM-830		
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment		

PIPING SYSTEM

Piping Exposure:	N/A			Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A	Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A	Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A			Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	N/A			Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 1972

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A	Probablity of Reaching Water:	N/A
Inititial Receptor:	N/A	Spill Equipment:	N/A
Intitial Conveyance:	N/A	Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST 1972

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	1982	Grid:	5G
		Installation Year:	1995
Tank Type:	UST	Location:	Building 1982
Capacity:	550	Facility Organization:	Unknown
Contents:	Waste Fuel	Facility:	Unknown
Current Use:	N/A	Nearest Building:	1982

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Unknown
		Tank Color:	Unknown
Construction Material:	FRP	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Unknown
Tank Dimension:	Unknown	Tank Manufacturer:	Unknown
Lining:	Unknown	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Unknown	Area Lighting:	Adequate
		Collision Barrier:	N/A
Liquid Level Gauge Type:	N/A	HLA Type:	N/A
Gauge Manufacturer:	N/A	HLA Manufacturer:	N/A
Gauge Model:	N/A	HLA Model:	N/A
Last Gauge Calibration:	N/A	Tank Leak Detection:	N/A
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	N/A	Tank LD Model:	N/A
Valves Surface Security:	N/A	Spill Catchment:	Unknown

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
		Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
		Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	N/A	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 1982

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A	Probablity of Reaching Water:	N/A
Initital Receptor:	N/A	Spill Equipment:	N/A
Intitial Conveyance:	N/A	Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 280.70(b).

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	

UST 1982

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	2021 M	Grid:	7C
Installation Year:	Unknown		
Tank Type:	AST	Location:	Bundy WWTP
Capacity:	5000	Facility Organization:	Unknown (BOSC)
Contents:	Methanol	Facility:	Unknown (BOSC)
Current Use:	Other	Nearest Building:	2021

LABELING AND CODING

Tank ID Label:	Yes	Capacity Label:	No
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Fair
Tank Color:	Blue		
Construction Material:	Welded Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Paint
Tank Dimension:	8 x 23'	Tank Manufacturer:	Unknown
Lining:	Not Available	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Automatic Tank Gauge	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Petrometer	HLA Manufacturer:	Petrometer
Gauge Model:	TX20	HLA Model:	TX20
Last Gauge Calibration:	N/A	Tank Leak Detection:	Petrometer
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Petrometer
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	TX20
Valves Surface Security:	Yes	Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
Pipe Corrosion Protection:	N/A		
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
Piping Leak Detection:	N/A		
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	N/A	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 2021 M

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A	Probablity of Reaching Water:	Low
Initital Receptor:	Sheet Flow SF-031	Spill Equipment:	N/A
Intitial Conveyance:	N/A	Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	1994
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST 2021M

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	2037	Grid:	6H
		Installation Year:	1997
Tank Type:	UST	Location:	Cabras Island
Capacity:	600	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Closed- Lines Capped	Nearest Building:	2037

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Unknown
		Tank Color:	Unknown
Construction Material:	FRP	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	Unknown	Tank Manufacturer:	Unknown
Lining:	Unknown	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Unknown	Area Lighting:	Unknown
		Collision Barrier:	N/A
Liquid Level Gauge Type:	Unknown	HLA Type:	Unknown
Gauge Manufacturer:	Unknown	HLA Manufacturer:	Unknown
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Unknown
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Unknown	Tank LD Model:	Unknown
Valves Surface Security:	Unknown	Spill Catchment:	Unknown

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
		Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
		Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	N/A	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 2037

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A	Probablity of Reaching Water:	N/A
Initital Receptor:	N/A	Spill Equipment:	N/A
Intitial Conveyance:	N/A	Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Lines capped and closed in accordance with 280.70(b).

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	

UST 2037

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	2304	Grid:	5I
Installation Year:	1993		
Tank Type:	UST	Location:	Telemetry Site
Capacity:	4000	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Emergency Power Generation	Nearest Building:	2304

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Unknown
Tank Color:	Unknown		
Construction Material:	FRP	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Unknown
Tank Dimension:	Unknown	Tank Manufacturer:	Unknown
Lining:	Unknown	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Unknown	Area Lighting:	Inadequate
Collision Barrier:	N/A		
Liquid Level Gauge Type:	Unknown	HLA Type:	Unknown
Gauge Manufacturer:	Unknown	HLA Manufacturer:	Unknown
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Unknown
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Unknown	Tank LD Model:	Unknown
Valves Surface Security:	Unknown	Spill Catchment:	Unknown

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	Unknown
Pipe Condition:	Unknown	Pipe Length:	Unknown
Pipe Corrosion Protection:	N/A		
Supply Pipe Diameter:	Unknown	Pipe Sumps:	Unknown
Piping Leak Detection:	Unknown		
Return Pipe Diameter:	Unknown	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 2304

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	Unknown
Probablity of Reaching Water:	Low
Initital Receptor:	N/A
Spill Equipment:	None
Intitial Conveyance:	N/A
Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

Remove tank.

Notes:

Permanently closed in accordance with 280.70(b).

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	
Next STI Inspection:	

UST 2304

Quick Find:

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	2357	Grid:	6B
Installation Year:	1999		
Tank Type:	AST	Location:	USMC HQ
Capacity:	1000	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Heating	Nearest Building:	2357

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	White		
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 4.5' x 3'4"	Tank Manufacturer:	ConVault
Lining:	N/A	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Inadequate		
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Krueger	HLA Manufacturer:	Warrick Controls
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Warrick Controls
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Warrick Controls
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
Pipe Corrosion Protection:	N/A		
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
Piping Leak Detection:	N/A		
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	N/A	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 2357

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A	Probablity of Reaching Water:	Low
Initital Receptor:	N/A	Spill Equipment:	N/A
Intitial Conveyance:	N/A	Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank.

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST 2357

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	2407	Grid:	5D
		Installation Year:	Unknown
Tank Type:	AST	Location:	Parabolic Compound
Capacity:	1000	Facility Organization:	Unknown (BOSC)
Contents:	Diesel	Facility:	Unknown (BOSC)
Current Use:	Emergency Power Generation	Nearest Building:	2407

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Poor
		Tank Color:	White
Construction Material:	Welded Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Painted
Tank Dimension:	11' x 4.5' x 3'4"	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Inadequate
		Collision Barrier:	Inadequate
Liquid Level Gauge Type:	Clock Display	HLA Type:	Whistle Vent
Gauge Manufacturer:	Unknown	HLA Manufacturer:	Pneumercator
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Pneumercator
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Unknown
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
		Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
		Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Dike Tank	Containment Dimensions	13' x 6' x 2'
Drain Mechanism:	Drain Valve	Containment Volume:	1144
Drainage Outfall:	Ground Outside Dike	Drain Security:	Yes
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 2407

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A
Initital Receptor:	N/A
Intitial Conveyance:	N/A
Worst Case Discharge/Rate of Flow:	N/A
Probablity of Reaching Water:	N/A
Spill Equipment:	N/A
Ultimate Discharge	N/A

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	Never
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	Never
Next STI Inspection:	

AST 2407

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	296	Grid:	5D
Installation Year:	1999		
Tank Type:	AST	Location:	Navy Media Center
Capacity:	500	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Emergency Power Generation	Nearest Building:	296

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	Aggregate Finish		
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 4.5' x 3'4"	Tank Manufacturer:	ConVault
Lining:	N/A	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Inadequate		
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	Visible Gauge, High level alarm
Gauge Manufacturer:	Krueger	HLA Manufacturer:	Warrick Controls
Gauge Model:	Unknown	HLA Model:	Unknown
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Warrick Controls
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Warrick Controls
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	Unknown
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
Pipe Corrosion Protection:	N/A		
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
Piping Leak Detection:	N/A		
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 296

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A
Initital Receptor:	N/A
Intitial Conveyance:	N/A
Probablity of Reaching Water:	N/A
Spill Equipment:	N/A
Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	Never
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	N/A
Next STI Inspection:	

AST 296

Quick Find | | Status | Closed

GENERAL SYSTEM INFORMATION

Tank ID:	31B	Grid:	5G
Installation Year:	1996		
Tank Type:	AST	Location:	Building 31
Capacity:	1000	Facility Organization:	Unknown
Contents:	Used Oil	Facility:	Unknown
Current Use:	Temporary Storage	Nearest Building:	31

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Fair
Tank Color:	Yellow		
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Painted
Tank Dimension:	11'3" x 8' x 5'6"	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	None	HLA Type:	None
Gauge Manufacturer:	N/A	HLA Manufacturer:	N/A
Gauge Model:	N/A	HLA Model:	N/A
Last Gauge Calibration:	N/A	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	N/A	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	No Piping
Pipe Condition:	N/A	Pipe Length:	N/A
Pipe Corrosion Protection:	None		
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
Piping Leak Detection:	Visible Inspection		
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	N/A	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	39" x 24" x 13"
Drain Mechanism:	Drain Valve	Containment Volume:	8000
Drainage Outfall:	OWS	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 31B

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A	Probablity of Reaching Water:	N/A
Initital Receptor:	N/A	Spill Equipment:	N/A
Intitial Conveyance:		Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST 31B

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	31F	Grid:	5G
Installation Year:	1943		
Tank Type:	AST	Location:	Building 31
Capacity:	1000	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Emergency Power Generation	Nearest Building:	31

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Fair
Tank Color:	Yellow		
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Paint
Tank Dimension:	11' x 5'8" x 4'4"	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	None	HLA Type:	None
Gauge Manufacturer:	N/A	HLA Manufacturer:	N/A
Gauge Model:	N/A	HLA Model:	N/A
Last Gauge Calibration:	N/A	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	Aboveground	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
Pipe Corrosion Protection:	N/A		
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
Piping Leak Detection:	N/A		
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Concrete/Block	Containment Dimensions	15' x 5' x 2.7'
Drain Mechanism:	Drain Valve	Containment Volume:	1611
Drainage Outfall:	Ground Outside Dike	Drain Security:	Yes
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 31F

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A	Probablity of Reaching Water:	N/A
Initital Receptor:	N/A	Spill Equipment:	N/A
Intitial Conveyance:	N/A	Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST 31F

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	3176	Grid:	5H
Installation Year:	1989		
Tank Type:	UST	Location:	Camp Moscrip
Capacity:	1000	Facility Organization:	Camp Moscrip
Contents:	Diesel	Facility:	Camp Moscrip
Current Use:	N/A	Nearest Building:	3176

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Unknown
Tank Color:	Unknown		
Construction Material:	FRP	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	Unknown	Tank Manufacturer:	Unknown
Lining:	Unknown	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	N/A	Area Lighting:	Unknown
Collision Barrier:	N/A		
Liquid Level Gauge Type:	N/A	HLA Type:	N/A
Gauge Manufacturer:	N/A	HLA Manufacturer:	N/A
Gauge Model:	N/A	HLA Model:	N/A
Last Gauge Calibration:	N/A	Tank Leak Detection:	N/A
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	N/A	Tank LD Model:	N/A
Valves Surface Security:	N/A	Spill Catchment:	N/A

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
Pipe Corrosion Protection:	N/A		
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
Piping Leak Detection:	N/A		
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 3176

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A
Initital Receptor:	N/A
Intitial Conveyance:	N/A
Probablity of Reaching Water:	N/A
Spill Equipment:	N/A
Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

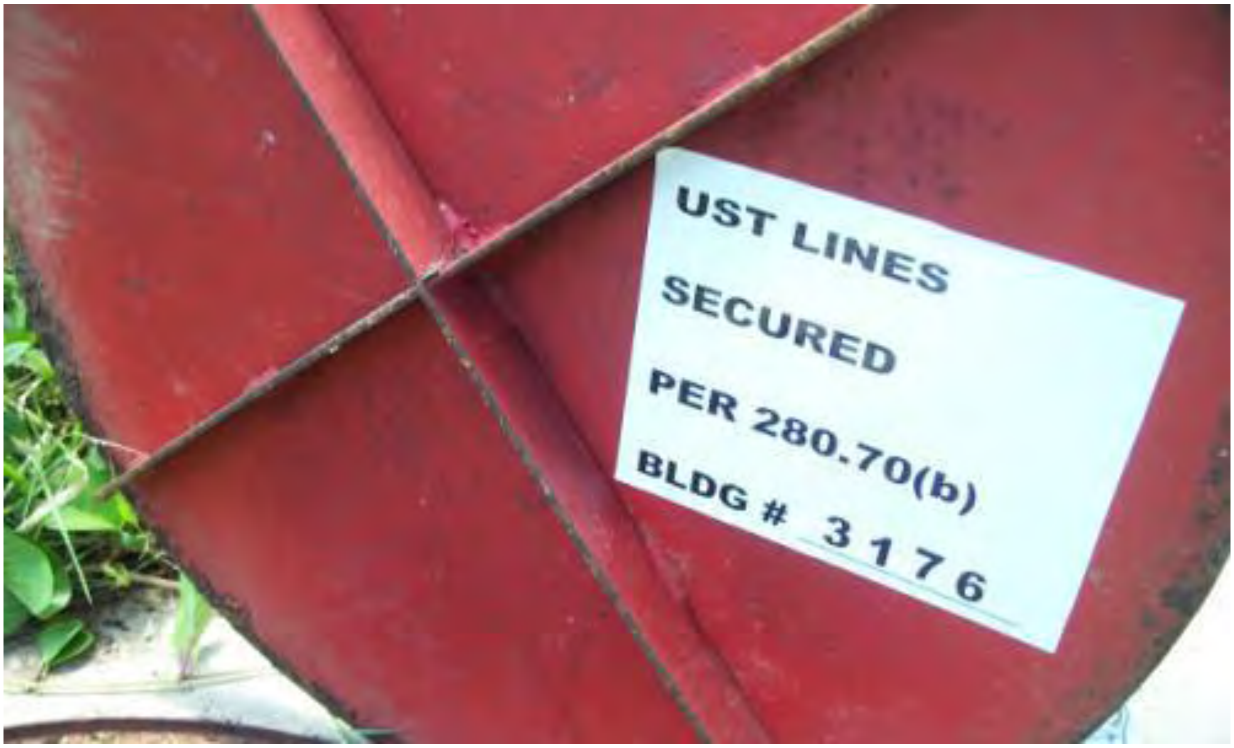
Remove tank

Notes:

Permanently closed in accordance with 280.70(b).

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	
Next STI Inspection:	



UST 3176

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	3178	Grid:	5H
Installation Year:	1989		
Tank Type:	UST	Location:	Camp Moscrip
Capacity:	1000	Facility Organization:	Camp Moscrip
Contents:	Diesel	Facility:	Camp Moscrip
Current Use:	N/A	Nearest Building:	3178

LABELING AND CODING

Tank ID Label:	Unknown	Capacity Label:	Unknown
Contents Label:	Unknown	Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Unknown
Tank Color:	Unknown		
Construction Material:	FRP	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	Unknown	Tank Manufacturer:	Unknown
Lining:	Unknown	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	N/A	Area Lighting:	Unknown
Collision Barrier:	N/A		
Liquid Level Gauge Type:	N/A	HLA Type:	N/A
Gauge Manufacturer:	N/A	HLA Manufacturer:	N/A
Gauge Model:	N/A	HLA Model:	N/A
Last Gauge Calibration:	N/A	Tank Leak Detection:	N/A
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	N/A	Tank LD Model:	N/A
Valves Surface Security:	N/A	Spill Catchment:	N/A

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
Pipe Corrosion Protection:	N/A		
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
Piping Leak Detection:	N/A		
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 3178

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A	Probablity of Reaching Water:	N/A
Initital Receptor:	N/A	Spill Equipment:	N/A
Intitial Conveyance:	N/A	Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 280.70(b).

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	

UST 3178

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	3179
Grid:	5H
Installation Year:	1989
Tank Type:	UST
Location:	Camp Moscrip
Capacity:	1000
Facility Organization:	Camp Moscrip
Contents:	Diesel
Facility:	Camp Moscrip
Current Use:	N/A
Nearest Building:	3179

LABELING AND CODING

Tank ID Label:	Unknown
Capacity Label:	Unknown
Contents Label:	Unknown
Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Unknown
Tank Color:	Unknown
Construction Material:	FRP
Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	Unknown
Tank Manufacturer:	Unknown
Lining:	Unknown
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	N/A
Area Lighting:	Unknown
Collision Barrier:	N/A
Liquid Level Gauge Type:	N/A
HLA Type:	N/A
Gauge Manufacturer:	N/A
HLA Manufacturer:	N/A
Gauge Model:	N/A
HLA Model:	N/A
Last Gauge Calibration:	N/A
Tank Leak Detection:	N/A
Next Gauge Calibration:	N/A
Tank LD Manfuacturer:	N/A
Pump Starter Control:	N/A
Tank LD Model:	N/A
Valves Surface Security:	N/A
Spill Catchment:	N/A

PIPING SYSTEM

Piping Exposure:	N/A
Pipe Construction Material:	N/A
Pipe Condition:	N/A
Pipe Length:	N/A
Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A
Pipe Sumps:	N/A
Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	N/A
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 3179

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A	Probablity of Reaching Water:	N/A
Initital Receptor:	N/A	Spill Equipment:	N/A
Intitial Conveyance:	N/A	Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 280.70(b).

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	

UST 3179

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	3180	Grid:	5H
		Installation Year:	1989
Tank Type:	UST	Location:	Camp Moscrip
Capacity:	1000	Facility Organization:	Camp Moscrip
Contents:	Diesel	Facility:	Camp Moscrip
Current Use:	N/A	Nearest Building:	3180

LABELING AND CODING

Tank ID Label:	Unknown	Capacity Label:	Unknown
Contents Label:	Unknown	Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Unknown
		Tank Color:	Unknown
Construction Material:	FRP	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	Unknown	Tank Manufacturer:	Unknown
Lining:	Unknown	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	N/A	Area Lighting:	Unknown
		Collision Barrier:	N/A
Liquid Level Gauge Type:	N/A	HLA Type:	N/A
Gauge Manufacturer:	N/A	HLA Manufacturer:	N/A
Gauge Model:	N/A	HLA Model:	N/A
Last Gauge Calibration:	N/A	Tank Leak Detection:	N/A
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	N/A	Tank LD Model:	N/A
Valves Surface Security:	N/A	Spill Catchment:	N/A

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
		Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
		Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 3180

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A	Probablity of Reaching Water:	N/A
Initital Receptor:	N/A	Spill Equipment:	N/A
Intitial Conveyance:	N/A	Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

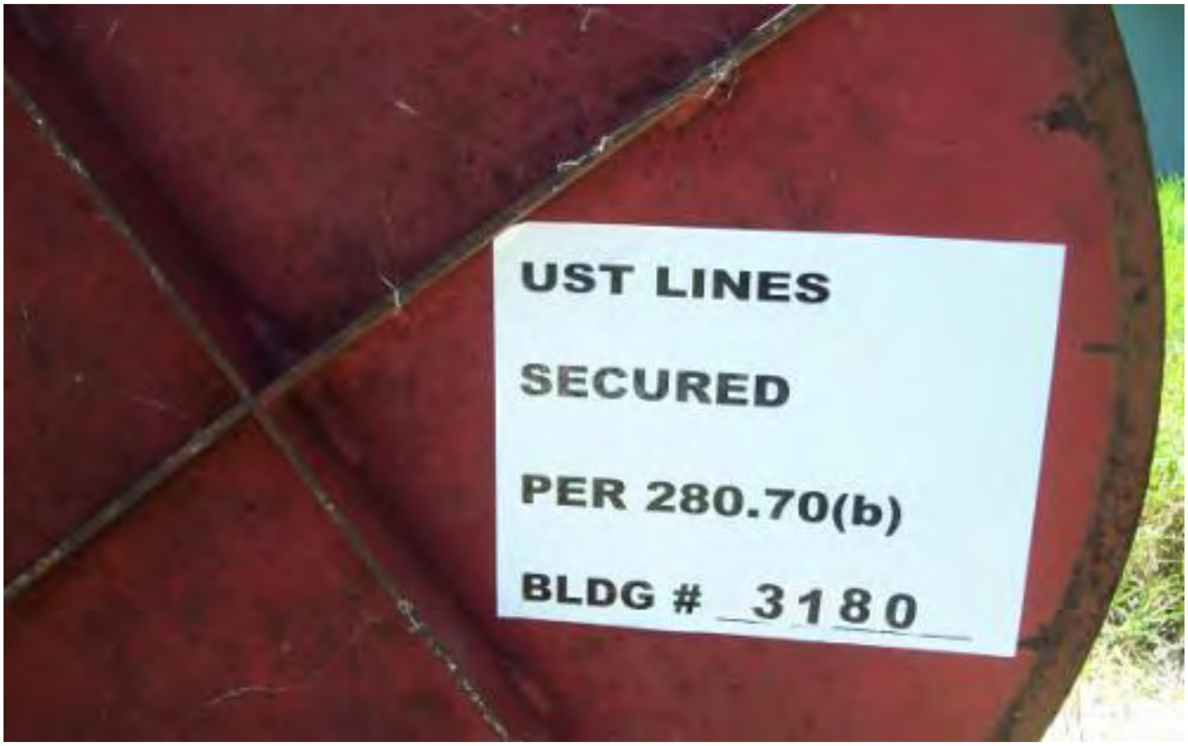
Remove tank

Notes:

Permanently closed in accordance with 280.70(b).

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	
		Next STI Inspection:	



UST 3180

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	3181	Grid:	5H
		Installation Year:	1989
Tank Type:	UST	Location:	Camp Moscrip
Capacity:	1000	Facility Organization:	Camp Moscrip
Contents:	Diesel	Facility:	Camp Moscrip
Current Use:	N/A	Nearest Building:	3181

LABELING AND CODING

Tank ID Label:	Unknown	Capacity Label:	Unknown
Contents Label:	Unknown	Fill Port Color Coded:	Unknown

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Unknown
		Tank Color:	Unknown
Construction Material:	FRP	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	Unknown	Tank Manufacturer:	Unknown
Lining:	Unknown	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	N/A	Area Lighting:	Unknown
		Collision Barrier:	N/A
Liquid Level Gauge Type:	N/A	HLA Type:	N/A
Gauge Manufacturer:	N/A	HLA Manufacturer:	N/A
Gauge Model:	N/A	HLA Model:	N/A
Last Gauge Calibration:	N/A	Tank Leak Detection:	N/A
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	N/A	Tank LD Model:	N/A
Valves Surface Security:	N/A	Spill Catchment:	N/A

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
		Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
		Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 3181

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A
Initital Receptor:	N/A
Intitial Conveyance:	N/A
Probablity of Reaching Water:	N/A
Spill Equipment:	N/A
Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 280.70(b).

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	
Next STI Inspection:	

UST 3181

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	500	Grid:	6B
Installation Year:	1999		
Tank Type:	AST	Location:	FPCONB
Capacity:	1000	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Emergency Power Generation	Nearest Building:	500

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	Aggregate Finish		
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 5'8" x 4'4"	Tank Manufacturer:	ConVault
Lining:	N/A	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	None
Gauge Manufacturer:	Unknown	HLA Manufacturer:	N/A
Gauge Model:	Unknown	HLA Model:	N/A
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	Fenced Facility	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
Pipe Corrosion Protection:	N/A		
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
Piping Leak Detection:	N/A		
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 500

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	N/A
Initital Receptor:	N/A
Intitial Conveyance:	N/A
Probablity of Reaching Water:	N/A
Spill Equipment:	N/A
Ultimate Discharge	N/A
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	Never
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	Never
Next STI Inspection:	


PERMANENTLY
CLOSED AST
PER 40 CFR 112.2
BLDG # 500
1,000 GALLONS

AST 500

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	56C	Grid:	5G
Installation Year:	1996		
Tank Type:	AST	Location:	Building 1982, Pumphouse
Capacity:	5000	Facility Organization:	Unknown
Contents:	Used Oil	Facility:	Unknown
Current Use:	Temporary Storage	Nearest Building:	1982

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	No
Contents Label:	No	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	SW	Tank Condition:	Fair
Tank Color:	Yellow		
Construction Material:	Steel	Tank Manifolded:	No
Tank Shape:	Horizontal Cylinder	Corrosion Protection:	Painted
Tank Dimension:	6' x 25'	Tank Manufacturer:	Unknown
Lining:	None	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	None	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	None	HLA Type:	None
Gauge Manufacturer:	N/A	HLA Manufacturer:	N/A
Gauge Model:	N/A	HLA Model:	N/A
Last Gauge Calibration:	N/A	Tank Leak Detection:	Visual Inspection
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	N/A
Pump Starter Control:	Inaccessible to Unauthorized Personnel	Tank LD Model:	N/A
Valves Surface Security:	Yes	Spill Catchment:	Inside dike

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
Pipe Corrosion Protection:	N/A		
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
Piping Leak Detection:	N/A		
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	N/A	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	Dike Tank	Containment Dimensions	27' x 7' x 5'
Drain Mechanism:	Unknown	Containment Volume:	5890
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 56C

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South
Initital Receptor:	N/A
Intitial Conveyance:	N/A
Probablity of Reaching Water:	Medium
Spill Equipment:	None
Ultimate Discharge	Ensenada Honda
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	Never
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	Never
Next STI Inspection:	

AST 56C

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	729
Grid:	7B
Installation Year:	1996
Tank Type:	AST
Location:	Building 729
Capacity:	1000
Facility Organization:	Unknown
Contents:	Diesel
Facility:	Unknown
Current Use:	Heating
Nearest Building:	729

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	Off White
Construction Material:	Concrete/Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 5'8" x 4'4"
Tank Manufacturer:	ConVault
Lining:	30-mil HDPE
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Krueger
HLA Manufacturer:	Soil Sentry
Gauge Model:	Unknown
HLA Model:	TLM-830
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Soil Sentry
Next Gauge Calibration:	N/A
Tank LD Manfuacturer:	Soil Sentry
Pump Starter Control:	Adequate
Tank LD Model:	TLM-830
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	N/A
Pipe Construction Material:	N/A
Pipe Condition:	N/A
Pipe Length:	N/A
Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A
Pipe Sumps:	N/A
Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	N/A
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 729

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Low
Initital Receptor:	Parking lot	Spill Equipment:	None
Intitial Conveyance:	N/A	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST 729

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	731
Grid:	6B
Installation Year:	1996
Tank Type:	AST
Location:	Bundy
Capacity:	1000
Facility Organization:	Unknown
Contents:	Diesel
Facility:	Unknown
Current Use:	Heating
Nearest Building:	731

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	Off White
Construction Material:	Concrete/Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 5'8" x 4'4"
Tank Manufacturer:	ConVault
Lining:	30-mil HDPE
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Krueger
HLA Manufacturer:	Soil Sentry
Gauge Model:	Unknown
HLA Model:	TLM-830
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Soil Sentry
Next Gauge Calibration:	N/A
Tank LD Manfuacturer:	Soil Sentry
Pump Starter Control:	Adequate
Tank LD Model:	TLM-830
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	N/A
Pipe Construction Material:	N/A
Pipe Condition:	N/A
Pipe Length:	N/A
Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A
Pipe Sumps:	N/A
Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	N/A
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 731

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Low
Initital Receptor:	Parking lot	Spill Equipment:	None
Intitial Conveyance:	N/A	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	1994
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	


DIESEL FUEL
PERMANENTLY
CLOSED AST
PER 40 CFR 112.2
BLDG # 731
OF OHIO
1-800/837-109

AST 731

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	732	Grid:	6B
Installation Year:	1996		
Tank Type:	AST	Location:	Bundy
Capacity:	1000	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Heating	Nearest Building:	732

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	Off White		
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 5'8" x 4'4"	Tank Manufacturer:	ConVault
Lining:	30-mil HDPE	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Krueger	HLA Manufacturer:	Soil Sentry
Gauge Model:	Unknown	HLA Model:	TLM-830
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Soil Sentry
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Soil Sentry
Pump Starter Control:	Adequate	Tank LD Model:	TLM-830
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
Pipe Corrosion Protection:	N/A		
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
Piping Leak Detection:	N/A		
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 732

DISPENSNG TANK SYSTEMS

Dispenser:	N/A
Number of Dispenser	N/A
Nozzles per Dispensers:	N/A
VRS Stage 1:	N/A
VRS Stage 2:	N/A
Emergency Shutoff:	N/A
Hose Retractor:	N/A
Shear Valve:	N/A
Nozzle Swivel Connector:	N/A
Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South
Initital Receptor:	Parking lot
Intitial Conveyance:	N/A
Probablity of Reaching Water:	Low
Spill Equipment:	None
Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	N/A

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:	
Monthly Leak Detection Monitoring:	
CP Bimonthly System Check:	
Last Cathodic Protection Test:	
Next Cathodic Protection Test:	
Last Spill Bucket Test:	
Next Spill Bucket Test:	
Last Containment Sump Test:	
Next Containment Sump Test:	
Last Formal External API 653:	
Next Formal External API 653:	
Last Formal Piping Inspection:	Never
Next Formal Piping Inspection:	
STI Inspection Category:	
STI Inspection Schedule:	
STI Internal Inspection:	
STI External Inspection:	
Last STI Inspection:	Never
Next STI Inspection:	

AST 732

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	733
Grid:	6B
Installation Year:	1996
Tank Type:	AST
Location:	Bundy
Capacity:	1000
Facility Organization:	Unknown
Contents:	Diesel
Facility:	Unknown
Current Use:	Heating
Nearest Building:	733

LABELING AND CODING

Tank ID Label:	No
Capacity Label:	Yes
Contents Label:	Yes
Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW
Tank Condition:	Good
Tank Color:	Off White
Construction Material:	Concrete/Steel
Tank Manifolded:	No
Tank Shape:	Rectangular
Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 5'8" x 4'4"
Tank Manufacturer:	ConVault
Lining:	30-mil HDPE
Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm
Area Lighting:	Adequate
Collision Barrier:	Adequate
Liquid Level Gauge Type:	Pop-up Display
HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Krueger
HLA Manufacturer:	Soil Sentry
Gauge Model:	Unknown
HLA Model:	TLM-830
Last Gauge Calibration:	Unknown
Tank Leak Detection:	Soil Sentry
Next Gauge Calibration:	N/A
Tank LD Manfuacturer:	Soil Sentry
Pump Starter Control:	Adequate
Tank LD Model:	TLM-830
Valves Surface Security:	Yes
Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	N/A
Pipe Construction Material:	N/A
Pipe Condition:	N/A
Pipe Length:	N/A
Pipe Corrosion Protection:	N/A
Supply Pipe Diameter:	N/A
Pipe Sumps:	N/A
Piping Leak Detection:	N/A
Return Pipe Diameter:	N/A
Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction
Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW
Containment Dimensions	N/A
Drain Mechanism:	N/A
Containment Volume:	N/A
Drainage Outfall:	N/A
Drain Security:	N/A
Loading/UnLoading Containment:	N/A
Loading/Unloading Containment Recommendations	None

Continuation of Tank ID: 733

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Low
Initital Receptor:	Parking lot	Spill Equipment:	None
Intitial Conveyance:	N/A	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	1994
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	

AST 733

Quick Find

Status: Closed

GENERAL SYSTEM INFORMATION

Tank ID:	734	Grid:	6B
Installation Year:	1996		
Tank Type:	AST	Location:	Bundy
Capacity:	1000	Facility Organization:	Unknown
Contents:	Diesel	Facility:	Unknown
Current Use:	Heating	Nearest Building:	734

LABELING AND CODING

Tank ID Label:	No	Capacity Label:	Yes
Contents Label:	Yes	Fill Port Color Coded:	No

TANK INFORMATION

Construction Type:	DW	Tank Condition:	Good
Tank Color:	Off White		
Construction Material:	Concrete/Steel	Tank Manifolded:	No
Tank Shape:	Rectangular	Corrosion Protection:	Corrosion Resistant Material
Tank Dimension:	11' x 5'8" x 4'4"	Tank Manufacturer:	ConVault
Lining:	30-mil HDPE	Model Number:	Unknown

SPILL AND OVERFILL PROTECTION

Overfill Protection:	Visible Gauge/High-Level Alarm	Area Lighting:	Adequate
Collision Barrier:	Adequate		
Liquid Level Gauge Type:	Pop-up Display	HLA Type:	Audible (Electronic)
Gauge Manufacturer:	Krueger	HLA Manufacturer:	Soil Sentry
Gauge Model:	Unknown	HLA Model:	TLM-830
Last Gauge Calibration:	Unknown	Tank Leak Detection:	Soil Sentry
Next Gauge Calibration:	N/A	Tank LD Manfuacturer:	Soil Sentry
Pump Starter Control:	Adequate	Tank LD Model:	TLM-830
Valves Surface Security:	Yes	Spill Catchment:	Overfill Containment

PIPING SYSTEM

Piping Exposure:	N/A	Pipe Construction Material:	N/A
Pipe Condition:	N/A	Pipe Length:	N/A
Pipe Corrosion Protection:	N/A		
Supply Pipe Diameter:	N/A	Pipe Sumps:	N/A
Piping Leak Detection:	N/A		
Return Pipe Diameter:	N/A	Pressurized Piping Line Leak Detectors:	N/A
Delivery System:	Suction	Annual Line Leak Detectors Testing:	N/A

SECONDARY CONTAINMENT SYSTEM

Tank Secondary Containment:	DW	Containment Dimensions	N/A
Drain Mechanism:	N/A	Containment Volume:	N/A
Drainage Outfall:	N/A	Drain Security:	N/A
Loading/UnLoading Containment:	N/A		
Loading/Unloading Containment Recommendations	None		

Continuation of Tank ID: 734

DISPENSNG TANK SYSTEMS

Dispenser:	N/A	VRS Stage 1:	N/A	Hose Retractor:	N/A
Number of Dispenser	N/A	VRS Stage 2:	N/A	Shear Valve:	N/A
Nozzles per Dispensers:	N/A	Emergency Shutoff:	N/A	Nozzle Swivel Connector:	N/A
				Break Away Coupling:	N/A

SPILL RESPONSE INFORMATION

Initial Spill Direction	South	Probablity of Reaching Water:	Low
Initital Receptor:	Parking lot	Spill Equipment:	None
Intitial Conveyance:	N/A	Ultimate Discharge	Atlantic Ocean
Worst Case Discharge/Rate of Flow:	N/A		

BMP Recommendations

Remove tank

Notes:

Permanently closed in accordance with 112.2.

INSPECTIONS, TESTING, AND MAINTENANCE

Routine Inspection Frequency:		Last Formal External API 653:	
Monthly Leak Detection Monitoring:		Next Formal External API 653:	
CP Bimonthly System Check:		Last Formal Piping Inspection:	Never
Last Cathodic Protection Test:		Next Formal Piping Inspection:	
Next Cathodic Protection Test:		STI Inspection Category:	
Last Spill Bucket Test:		STI Inspection Schedule:	
Next Spill Bucket Test:		STI Internal Inspection:	
Last Containment Sump Test:		STI External Inspection:	
Next Containment Sump Test:		Last STI Inspection:	Never
		Next STI Inspection:	


PERMANENTLY
CLOSED AST
PER 40 CFR 112.2
BLDG # 734
1-800/837-1095
DIESEL

AST 734

APPENDIX I
CD OF TANK DATABASE

APPENDIX J
MATERIAL SAFETY DATA SHEETS

MATERIAL SAFETY DATA SHEET

Low Sulfur Diesel Fuel **MSDS No. 1797**

EMERGENCY OVERVIEW
CAUTION!
OSHA/NFPA COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT
EFFECTS CENTRAL NERVOUS SYSTEM
HARMFUL OR FATAL IF SWALLOWED

Moderate fire hazard. Avoid breathing vapors or mists. May cause dizziness and drowsiness. May cause moderate eye irritation and skin irritation (rash). Long-term, repeated exposure may cause skin cancer.
If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).

NFPA 704 (Section 16)

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

HOVENSA LLC
1 Estate Hope
Christiansted, VI 00820-5652

EMERGENCY TELEPHONE NUMBER (24 hrs):	**CHEMTREC (800)424-9300**
COMPANY CONTACT (business hours):	**(340) 692-3000**

SYNONYMS: Diesel Fuel #2; Hess Premium Diesel; Low Sulfur Diesel; Motor Vehicle Diesel Fuel

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and CHEMICAL INFORMATION ON INGREDIENTS

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Diesel Fuel (68476-34-6)	100
Napthalene (91-20-3)	Typically < 0.01

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher. Premium Diesel Fuel contains a multifunctional additive.

3. HAZARDS IDENTIFICATION

EYES
Contact with liquid or vapor may cause mild irritation.

SKIN
May cause skin irritation with prolonged or repeated contact. Practically non-toxic if absorbed following acute (single) exposure. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

INGESTION
The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY

Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11 Toxicological Information.

IARC classifies whole diesel fuel exhaust particulates as probably carcinogenic to humans (Group 2A). NIOSH regards whole diesel fuel exhaust particulates as a potential cause of occupational lung cancer based on animal studies and limited evidence in humans.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

4. FIRST AID MEASURES

EYES

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION

Remove person to fresh air. If person is not breathing provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

FLASH POINT:	> 125 ^{o}F (> 52 ^{o}C) minimum PMCC
AUTOIGNITION POINT:	494 ^{o}F (257 ^{o}C)
OSHA/NFPA FLAMMABILITY CLASS:	2 (COMBUSTIBLE)
LOWER EXPLOSIVE LIMIT (%):	0.6
UPPER EXPLOSIVE LIMIT (%):	7.5

FIRE AND EXPLOSION HAZARDS

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

FIRE FIGHTING INSTRUCTIONS
Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY'S SPILL CONTINGENCY OR EMERGENCY RESPONSE PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE

HANDLING PRECAUTIONS
Handle as a combustible liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

STORAGE PRECAUTIONS
Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES
Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION

EXPOSURE LIMITS

Components (CAS No.)	Source	Exposure Limits TWA/STEL	Note
Diesel Fuel: (68476-34-6)	OSHA	5 mg/m, as mineral oil mist	
	ACGIH	100 mg/m^3 (as totally hydrocarbon vapor) TWA	A3, skin
Naphthalene (91-20-3)	OSHA	10 ppm TWA	
	ACGIH	10 ppm TWA / 15 ppm STEL	A4, Skin

ENGINEERING CONTROLS
Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION
Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION
Gloves constructed of nitrile, neoprene, or PVC are recommended. Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION
A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE
Clear, straw-yellow liquid

ODOR
Mild, petroleum distillate odor

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	320 to 690 oF (160 to 366 ^{o}C)
VAPOR PRESSURE:	0.009 psia @ 70 ^{o}F (21 ^{o}C)
VAPOR DENSITY (air = 1):	> 1.0
SPECIFIC GRAVITY (H_2O = 1):	0.83 to 0.86 @ 60 ^{o}F (16 ^{o}C)
PERCENT VOLATILES:	100 %
EVAPORATION RATE:	Slow; varies with conditions
SOLUBILITY (H_2O):	Negligible

10. STABILITY and REACTIVITY

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS
Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers; Viton ® ; Fluorel ®

HAZARDOUS DECOMPOSITION PRODUCTS
Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

11. TOXICOLOGICAL PROPERTIES

ACUTE TOXICITY

Acute dermal LD50 (rabbits): > 5 ml/kg	Acute oral LD50 (rats): 9 ml/kg
Primary dermal irritation: extremely irritating (rabbits)	Draize eye irritation: non-irritating (rabbits)
Guinea pig sensitization: negative	

CHRONIC EFFECTS AND CARCINOGENICITY
Carcinogenic: OSHA: NO IARC: NO NTP: NO ACGIH: A3

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

MUTAGENICITY (genetic effects)
This material has been positive in a mutagenicity study.

12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

PROPER SHIPPING NAME:	Diesel Fuel	Placard (International Only):
HAZARD CLASS and PACKING GROUP:	3, PG III	
DOT IDENTIFICATION NUMBER:	NA 1993 (Domestic) UN 1202 (International)	
DOT SHIPPING LABEL:	None	

Use Combustible Placard if shipping in bulk domestically

15. REGULATORY INFORMATION

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other regulations at the state and/or local level. Consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the *de minimis* levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

CALIFORNIA PROPOSITON 65 LIST OF CHEMICALS

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

INGREDIENT NAME (CAS NUMBER)	**Date Listed**
Diesel Engine Exhaust (no CAS Number listed)	10/01/1990

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 3 (Combustible Liquid) and Class D, Division 2, Subdivision B (Toxic by other means)

16. OTHER INFORMATION

NFPA® HAZARD RATING

HEALTH:	0	
FIRE:	2	
REACTIVITY:	0	

Refer to NFPA 704 "Identification of the Fire Hazards of Materials" for further information

HMIS® HAZARD RATING

HEALTH:	1 *	Slight
FIRE:	2	Moderate
PHYSICAL:	0	Negligible
		* Chronic

SUPERSEDES MSDS DATED: 02/28/2001

ABBREVIATIONS:

AP = Approximately	< = Less than	> = Greater than
N/A = Not Applicable	N/D = Not Determined	ppm = parts per million

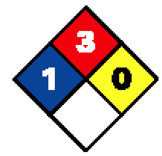
ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute (212) 642-4900
API	American Petroleum Institute (202) 682-8000
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
DOT	U.S. Department of Transportation [General info: (800) 467-4922]
EPA	U.S. Environmental Protection Agency
HMIS	Hazardous Materials Information System
IARC	International Agency For Research On Cancer
MSHA	Mine Safety and Health Administration
NFPA	National Fire Protection Association (617)770-3000
NIOSH	National Institute of Occupational Safety and Health
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)
NTP	National Toxicology Program
OPA	Oil Pollution Act of 1990
OSHA	U.S. Occupational Safety & Health Administration
PEL	Permissible Exposure Limit (OSHA)
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit (NIOSH)
SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
SCBA	Self-Contained Breathing Apparatus
SPCC	Spill Prevention, Control, and Countermeasures
STEL	Short-Term Exposure Limit (generally 15 minutes)
TLV	Threshold Limit Value (ACGIH)
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average (8 hr.)
WEEL	Workplace Environmental Exposure Level (AIHA)
WHMIS	Canadian Workplace Hazardous Materials Information System

MATERIAL SAFETY DATA SHEET

Gasoline, All Grades **MSDS 6312**

EMERGENCY OVERVIEW
DANGER!
EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED - ASPIRATION HAZARD



NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

1. CHEMICAL PRODUCT and COMPANY INFORMATION

HOVENSA LLC
1 Estate Hope
Christiansted, VI 00820-5652

EMERGENCY TELEPHONE NUMBER (24 hrs): **CHEMTREC (800)424-9300**
COMPANY CONTACT (business hours): **(340) 692-3000**

SYNONYMS: HOVENSA Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS *

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Naphthalene (91-20-3)	0.444
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

3. HAZARDS IDENTIFICATION

EYES
Moderate irritant. Contact with liquid or vapor may cause irritation.

SKIN
Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

INGESTION
The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION
Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY
Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 – Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

4. FIRST AID MEASURES

EYES
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION
Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

FLASH POINT:	-45 ^{o}F (-43^{o}C)
AUTOIGNITION TEMPERATURE:	highly variable; > 530 ^{o}F (>280 ^{o}C)
OSHA/NFPA FLAMMABILITY CLASS:	1A (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	1.4%
UPPER EXPLOSIVE LIMIT (%):	7.6%

FIRE AND EXPLOSION HAZARDS
Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA
SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration – refer to NFPA 11 "Low Expansion Foam – 1994 Edition."

FIRE FIGHTING INSTRUCTIONS
Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal – caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE

HANDLING PRECAUTIONS

******USE ONLY AS A MOTOR FUEL******
******DO NOT SIPHON BY MOUTH******

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) – see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION

EXPOSURE LIMITS

Component (CAS No.)	Source	TWA (ppm)	STEL (ppm)	Note
Gasoline (86290-81-5)	ACGIH	300	500	A3
Benzene (71-43-2)	OSHA	1	5	Carcinogen
	ACGIH	0.5	2.5	A1, skin
	USCG	1	5	
n-Butane (106-97-8)	ACGIH	1000	--	Aliphatic Hydrocarbon Gases Alkane (C1-C4)
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--	
	ACGIH	1000	--	A4
Ethyl benzene (100-41-4)	OSHA	100	--	
	ACGIH	100	125	A3
n-Hexane (110-54-3)	OSHA	500	--	
	ACGIH	50	--	skin
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50		A3
Napthalene	OSHA	10		
	ACGIH	10	15	A4, skin
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established
Toluene (108-88-3)	OSHA	200		Ceiling: 300 ppm; Peak: 500 ppm (10 min.)
	ACGIH	50	--	A4 (skin) Note: 2006 NOIC 20 ppm (TWA)
1,2,4- Trimethylbenzene (95-63-6)	ACGIH	25	--	
Xylene, mixed isomers (1330-20-7)	OSHA	100	--	
	ACGIH	100	150	A4

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem ®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE

A translucent, straw-colored or light yellow liquid

ODOR

A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

ODOR THRESHOLD

	Odor Detection	Odor Recognition
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	85 to 437 °F (39 to 200 °C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H_2O = 1):	0.70 – 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %
SOLUBILITY (H_2O):	Non-oxygenated gasoline - negligible (< 0.1% @ 77 °F). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 °F); ethanol is readily soluble in water

10. STABILITY and REACTIVITY

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

INCOMPATIBLE MATERIALS

Keep away from strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

11. TOXICOLOGICAL PROPERTIES

ACUTE TOXICITY

Acute Dermal LD50 (rabbits): > 5 ml/kg
Acute Oral LD50 (rat): 18.75 ml/kg
Primary dermal irritation (rabbits): slightly irritating
Draize eye irritation (rabbits): non-irritating
Guinea pig sensitization: negative

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenicity: OSHA: NO IARC: YES - 2B NTP: NO ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

This product may contain methyl tertiary butyl ether (MTBE): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API (www.api.org) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

PLACARD:

DOT PROPER SHIPPING NAME:	Gasoline
DOT HAZARD CLASS and PACKING GROUP:	3, PG II
DOT IDENTIFICATION NUMBER:	UN 1203
DOT SHIPPING LABEL:	FLAMMABLE LIQUID

15. REGULATORY INFORMATION

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION
This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION WT. PERCENT
Benzene (71-43-2)	0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline)
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Naphthalene (91-20-3)	0.444
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents (www.epa.gov/tri) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION - Parts per million (ppm) by weight
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS
This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

INGREDIENT NAME (CAS NUMBER)	Date Listed
Benzene	2/27/1987
Ethyl benzene	6/11/2004
Naphthalene	4/19/2002
Toluene	1/1/1991

CANADIAN REGULATORY INFORMATION (WHMIS)
Class B, Division 2 (Flammable Liquid)
Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

16. OTHER INFORMATION

NFPA® HAZARD RATING		
	HEALTH:	1
	FIRE:	3
	REACTIVITY:	0

Refer to NJPA 704 "Identification of the Fire Hazards of Materials" for further information

HMIS® HAZARD RATING			
	HEALTH:	1*	Slight
	FIRE:	3	Serious
	PHYSICAL:	0	Minimal
			* CHRONIC

SUPERSEDES MSDS DATED: 1/8/2004

ABBREVIATIONS:

AP = Approximately	< = Less than	> = Greater than
N/A = Not Applicable	N/D = Not Determined	ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute (212)642-4900
API	American Petroleum Institute (202)682-8000
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
DOT	U.S. Department of Transportation [General Info: (800)467-4922]
EPA	U.S. Environmental Protection Agency
HMIS	Hazardous Materials Information System
IARC	International Agency For Research On Cancer
MSHA	Mine Safety and Health Administration
NFPA	National Fire Protection Association (617)770-3000
NIOSH	National Institute of Occupational Safety and Health
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)
NTP	National Toxicology Program
OPA	Oil Pollution Act of 1990
OSHA	U.S. Occupational Safety & Health Administration
PEL	Permissible Exposure Limit (OSHA)
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit (NIOSH)
SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
SCBA	Self-Contained Breathing Apparatus
SPCC	Spill Prevention, Control, and Countermeasures
STEL	Short-Term Exposure Limit (generally 15 minutes)
TLV	Threshold Limit Value (ACGIH)
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average (8 hr.)
WEEL	Workplace Environmental Exposure Level (AIHA)
WHMIS	Workplace Hazardous Materials Information System (Canada)

APPENDIX K
CONTINGENCY PLAN

DRAFT

CONTINGENCY PLAN

NAVAL ACTIVITY PUERTO RICO
EPA I.D. NO. PR2170027203
CEIBA, PUERTO RICO

JANUARY 2011

Prepared for:

DEPARTMENT OF THE NAVY
NAVFAC SOUTHEAST
North Charleston, SC

Under:

Contract No. N62470-10-D-3000
DELIVERY ORDER JM01

Prepared by:

MICHAEL BAKER JR., INC.
Moon Township, Pennsylvania

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LIST OF ACRONYMS AND ABBREVIATIONS

ACP	Area Contingency Plan
AST	Aboveground Storage Tank
BOSC	Base Operational Services Contractor
CFR	Code of Federal Regulations
CP	Contingency Plan
DOD	Department of Defense
EPA	U.S. Environmental Protection Agency
LDS	Leak Detection System
NAPR	Naval Activity Puerto Rico
NAVFAC	Naval Facilities Engineering Command
NFPA	National Fire Protection Association
NOSC	Naval On-Scene Coordinator
NOSCDR	Naval On-Scene Commander
NSRR	Naval Station Roosevelt Roads
O&M	Operation & Maintenance
OSHA	U.S. Occupational Safety and Health Administration
POL	Petroleum, Oil, or Lubricant
PST	Petroleum Storage Tank
SOP	Standard Operating Procedure
SPCC	Spill Prevention, Control, and Countermeasures (plan)
STMP	Storage Tank Management Plan
USCG	United States Coast Guard
USNAVSO	U.S. Naval Forces Southern Command
UST	Underground Storage Tank

1.0 INTRODUCTION

1.1 Purpose of Plan

This Contingency Plan (CP) has been prepared for Naval Activity Puerto Rico (NAPR) in accordance with Title 40 Code of Federal Regulations (CFR) 112.7 (d) to address locations throughout the facility where secondary containment is not possible or impracticable as documented in the facility Spill Prevention, Control, and Countermeasure (SPCC) Plan. The plan follows the format 40 CFR 109.5 with regard to addressing all the specific criteria stated therein.

The purpose of this CP is to clearly identify and define the procedures and tactics for effectively responding to a discharge of oil into navigable waters or adjoining shore lines of the United States, originating from NAPR. The CP is executed whenever a discharge of oil has reached or threatens navigable waters or adjoining shorelines.

The objective of the procedures in this CP is to protect the public, NAPR personnel, and other responders in the event of a Petroleum, Oil, or Lubricant (POL) discharge. The plan is intended to minimize the damage to the environment, natural resources, and facility installations from a POL discharge. This CP complements the prevention and control measures presented in the facilities SPCC Plan by addressing areas located throughout the facility that have inadequate secondary containment.

1.2 Background

Puerto Rico is the easternmost island of the Greater Antilles Group of the West Indies and is located approximately 1,000 miles southeast of Miami, Florida. NAPR, formerly known as the Naval Station Roosevelt Roads (NSRR), is located on the extreme eastern part of Puerto Rico in the city of Ceiba, approximately 50 miles from San Juan. NAPR was first commissioned as a U.S. Naval Operations Base in 1943. Through the years, the Base went through a series of expansions and contractions until in January 2004, the Navy decided to relocate U.S. Naval Forces Southern Command (USNAVSO) from Naval Station Roosevelt Roads, Puerto Rico, to Naval Station Mayport, Florida. On March 31, 2004, the facility became inoperative with Department of Defense (DOD) Police providing security. Only a few military and civilian personnel currently staff the former Naval Base. Their primary role is as caretaker, and they are charged with maintaining the current physical and environmental condition of the Base until the property is transferred.

1.3 Site Information

NAPR occupies approximately 8,800 acres on the northern side of the east coast of Puerto Rico. The property consists of 3,938 acres of upland property and 4,955 acres of environmentally sensitive areas including wetlands, mangrove, and wildlife habitat. The NAPR site location is shown on Figure 1-1 in Appendix B to the SPCC plan.

The regional area of NAPR consists of an interrupted, narrow coastal plain with small valleys extending from the Sierra de Luquillo range. In the immediate area of NAPR, elevations range from sea level to approximately 295 feet. Immediately to the north of the NAPR boundary, the hills rise abruptly to heights of 800 to 1,050 feet above sea level. Relief is low along the shoreline and lagoons and mangrove swamps are common.

The underlying geology of the NAPR area is predominantly volcanic (composed of lava and tuff), as well as sedimentary (rocks derived from discontinuous beds of limestone). These rocks all range in age from early Cretaceous to middle Eocene. The volcanic rocks and inter-bedded limestone have been complexly faulted, folded, metamorphosed, and intruded by dioritic rocks. In addition to the predominant volcanic and sedimentary rock, unconsolidated alluvial and older deposits from the Quaternary period underlie the northwestern and western sectors of the base. The primary geologic formations on and near NAPR are various beach deposits, alluvium, quartz diorite and granodiorite, quartz keratophyre, the Daguao Formation, and the Figuera Lava. The Peña Pobre fault zone traverses NAPR.

1.4 Surface Water Drainage

The surface waters that flow across the northeastern plain of Puerto Rico, where NAPR is located, originate on the eastern slopes of the Sierra De Luquillo Mountains. Surface runoff is channeled into various rivers and streams that eventually flow into the Caribbean Sea. The Daguao River and Quebrada Seca Stream (a tributary to Rio Daguao) collect surface waters from the hills immediately north of NAPR and, in periods of heavy rain, flooding on NAPR occurs. The Daguao-Quebrada Seca watershed comprises an area of approximately 7.6 square miles (4,900 acres), and the river falls some 700 feet from its source to sea level.

In the low-lying shore areas, seawater flooding results from storms, wind, and abnormally high tides. The tidal ranges in the NAPR area are small, with a maximum spring range of less than three feet. The tides are semidiurnal and have a usual range of about one-foot in the main harbor of NAPR.

Little information exists concerning the hydrogeology of NAPR. The only known potential sources of groundwater lie in lenticular beds of clay, sand and gravel, and rock fragments, which occur at a depth of less than 30 meters. No wells have been developed on site from these layers. Some wells had been developed upgradient of NAPR in Ceiba, approximately three kilometers from base headquarters, but were abandoned due to high levels of salinity.

The quality of surface waters is variable, reflecting the drainage area through which the water flows. Generally, surface waters have high turbidities and bio-organics (naturally occurring organics, such as decay products of vegetable and animal matter) due to the periodic heavy rains that can easily erode soils from steep slopes, exposed areas and disturbed streambeds. Water from alluvial aquifers along the coast of NAPR is of a calcium bicarbonate type, and has high concentrations of iron and manganese. The source of these minerals is unknown, but they may be derived from buried swamp or lagoon deposits.

2.0 REGULATIONS AND CODES

This CP follows the content and organization of 40 CFR 109 (*Criteria for State, Local and Regional Oil Removal Contingency Plans*) and describes the distribution of responsibilities and basic procedures for responding to an oil discharge and performing cleanup operations. This plan is required to be reviewed and updated annually, or in the event that new or updated information increases the effectiveness of this plan. In order to simplify use of this CP, the specific regulatory requirement is stated in bold italics and the NAPR response to the requirement follows. Specific recommendations, if required, will also be noted.

In addition, this plan also references the Puerto Rico and U.S. Virgin Islands Area Contingency Plan (ACP). The ACP for this region was last updated 27 May 2008 and is the local guidance document under the National Preparedness and Response System that is in place to address various environmental emergencies accidental or intentional in this geographical region. The ACP meets the requirements and intent of the National Response Plan (NRP) and build built around the concepts of the National Incident Management System (NIMS).

2.1 <u>40 CFR 109.5(a)</u>

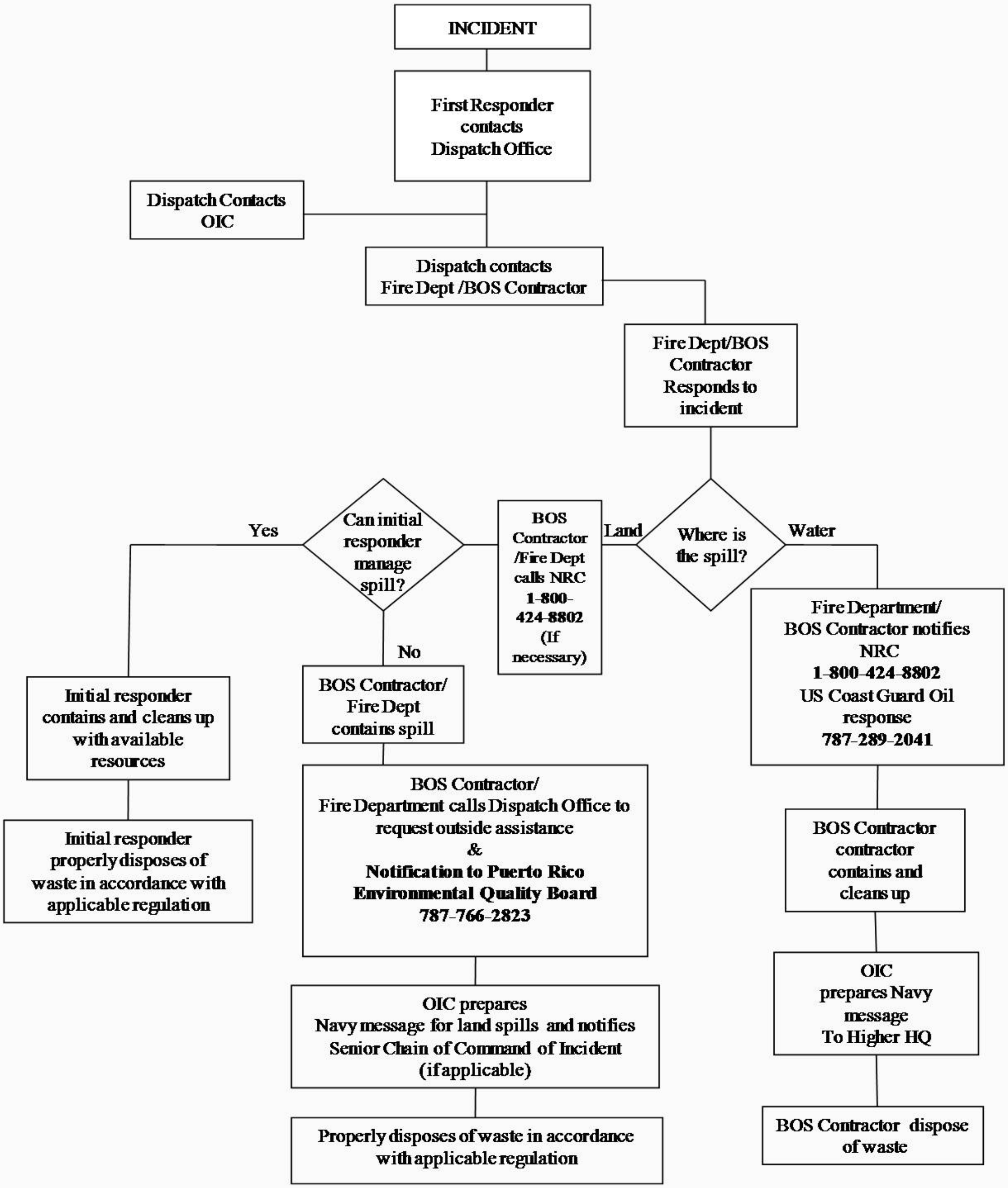
Definition of the authorities, responsibilities and duties of all persons, organizations or agencies which are to be involved or could be involved in planning or directing oil removal operations, with particular care to clearly define the authorities, responsibilities and duties of State and local governmental agencies to avoid unnecessary duplication of contingency planning activities and to minimize the potential for conflict and confusion that could result.

2.1.1 Response to 40 CFR 109.5(a)

NAPR has the primary responsibility for providing the initial response to oil discharge incidents originating from the facility. To accomplish this, NAPR has established an operations center that is manned by a dispatcher 24 hours a day, 365 days a year within Building 1205. The dispatcher has the ability to contact the fire department, security, Base Operations Services Contractor (BOSC) and/or other responders as necessary including federal, commonwealth, and local agencies by telephone. Two-way hand held radios are also used for communication within the facility.

In the event an oil release is discovered that is beyond the capability of the discoverer to cleanup safely, the Fire Department chief will take the lead role in spill response and product recovery. The Fire Department will be augmented by the NAPR BOSC if required. Specifically, Mr. Louis Medina of the NAPR Fire Department will act as the Response Coordinator. If the discharge is greater than the response capability of the Fire Department and the BOSC, the Fire Department will then request the services of outside services from a private environmental response company or the US Coast Guard if the spill threatens a waterway or the EPA if on land. The diagram in Figure 2-1 describes the flowchart for the response activity of NAPR personnel as well as Federal, State and local agencies that may also be involved in oil response operations.

FIGURE 2-1
BASIC OIL SPILL RESPONSE FLOW CHART



2.2 40 CFR 109.5(b)(1)

Establishment of notification procedures for the purpose of early detection and timely notification of an oil discharge including:

The identification of critical water use areas to facilitate the reporting of and response to oil discharges.

2.2.1 Response to 40 CFR 109.5(b)(1)

Procedurally, the SPCC Plan specifically notes that an inspection program be immediately implemented and inspections documented as a prevention management plan and a method of reducing spillage into the environment. NAPR is a restricted access federal facility and there is active security present at access points to the installation as well as active security on patrol 24-hours throughout the facility. The patrol activities should include observation of possible discharge from tanks. In the event of an accidental discharge, the Spill Response Notification form identified on Table 2-1 shall be used to report a discharge.

There are several critical water use areas on the NAPR facility. Many of these areas are located in close proximity to oil containment structures (AST, USTs & electrical operational equipment), as shown on Figures 1-2, 1-3, and 1-4 in Appendix B to the SPCC Plan, that could potentially reach these important areas if leaks were to occur. Since many natural resources are in close proximity, it is imperative that sufficient resources are readily available and immediately accessible to eliminate or substantially reduce the probability of spills in these areas.

Table 2-2 presents a list of navigable waters potentially affected.

Table 2-1: Spill Response Notification	
Name of Person Completing Form	
Date & Time Form Completed/Updated	
REPORTER INFORMATION	
Date and Time Initial Spill Report Received (24 hour time)	
REPORTER'S NAME (LAST, FIRST)	
REPORTER'S PHONE NUMBER	
Company, Squadron, Shop, or Department	
Position	
Reporter's Location	Building # and Street:
	City:
	State and Zip Code:
Confidential	☐ YES ☐ NO
INCIDENT DESCRIPTION	
MATERIAL RELEASED ☐ YES	☐ Oil/Fuel Type of Fuel _________________ ☐ Hazmat/Unknown Chemical Name & CHRIS Code__________
☐ NO	Is material a CERCLA Hazardous Substance? ☐ Yes ☐ No Is material an Extremely Hazardous Substance? ☐ Yes ☐ No
	Best Estimate of Quantity Released to Land ____________(include units) Best Estimate of Quantity Released to Water ____________(include units)
	Is material still being released ☐ Yes ☐ No Current Spill Rate__________
TYPE OF INCIDENT (CHECK ALL THAT APPLY)	☐ Inside building or containment area ☐ Flightline ☐ Soil ☐ Navigable Water (freshwater, marine, wetland, storm drain) ☐ Release to sanitary sewer ☐ Fire ☐ Explosion ☐ Air Release
SOURCE AND CAUSE OF INCIDENT	
DATE AND TIME OF INCIDENT (24 hour time)	
Date & Time Form Completed/Updated	

Table 2-1: Spill Response Notification	
REPORTER INFORMATION	
Date and Time Initial Spill Report Received (24 hour time)	
REPORTER'S NAME (LAST, FIRST)	
REPORTER'S PHONE NUMBER	
Company, Squadron, Shop, or Department	
Position	
Reporter's Location	Building # and Street:
	City:
	State and Zip Code:
Confidential	☐ YES ☐ NO
INCIDENT DESCRIPTION	
MATERIAL RELEASED ☐ YES	☐ Oil/Fuel Type of Fuel _________________ ☐ Hazmat/Unknown Chemical Name & CHRIS Code__________
☐ NO	Is material a CERCLA Hazardous Substance? ☐ Yes ☐ No Is material an Extremely Hazardous Substance? ☐ Yes ☐ No
	Best Estimate of Quantity Released to Land ____________(include units) Best Estimate of Quantity Released to Water ____________(include units)
	Is material still being released ☐ Yes ☐ No Current Spill Rate__________
TYPE OF INCIDENT (CHECK ALL THAT APPLY)	☐ Inside building or containment area ☐ Flightline ☐ Soil ☐ Navigable Water (freshwater, marine, wetland, storm drain) ☐ Release to sanitary sewer ☐ Fire ☐ Explosion ☐ Air Release
SOURCE AND CAUSE OF INCIDENT	
DATE AND TIME OF INCIDENT (24 hour time)	
INCIDENT ADDRESS/LOCATION	
(include state and zip code)	
County	
Nearest City & Distance from City (miles)	
Latitude (for marine spills)	___ Degrees___ Minutes ___ Seconds
Longitude (for marine spills)	___ Degrees___ Minutes ___ Seconds

Table 2-1: Spill Response Notification	
Container Type & Capacity (include units)	
Facility Capacity (include units)	
Weather Conditions	
Wind speed and direction. Temperature	
Precipitation Rate and Type	
Wave\Current Information (marine spills)	
RESPONSE ACTIONS	
Initial Actions Taken	1. Locate spill reporter.
	2. Establish initial command post location.
	3. Assign recorder.
	4. Rescue any injured individuals.
	5. Secure spill area and determine need for evacuation.
	6. Stop spill source, if not already accomplished.
	7. Complete initial site and material hazard assessments.
	8. Prepare site maps.
	9. Establish hot/warm/cold/safe zones
	10. Prevent spill from spreading.
Actions Taken to Stop Release	
Actions Taken to Contain Release	
Actions Taken to Cleanup Release	

Table 2-1: Spill Response Notification			
IMPACT/HEALTH THREATS			
NUMBER OF INJURIES			
NUMBER OF DEATHS			
EVACUATION(S) REQUIRED	Yes	NO	
Description of Areas to be Evacuated and Areas Already Evacuated including Number Evacuated			
Was There Any Property Damage?	YES	NO	
Damage in Dollars (estimated)			
Environmental Media Affected			
DESCRIPTION OF ENVIRONMENTAL AND HEALTH THREATS INCLUDINGAREAS THREATENED			
PRECAUTIONS TO MINIMIZE HEALTH THREATS TO LOCAL RESIDENTS INCLUDING MEDICAL ADVICE			
Additional Information Any information about the incident not recorded elsewhere in the report			
AGENCY NOTIFICATIONS			
NOSC	YES	NO	TIME:
NRC 1-800-424-8802	YES TIME (24 Hour):	NO	NRC Call No.___________________
EPA	YES	NO	TIME:
USCG	YES	NO	TIME:
AS State Dept. of Emergency Mgmt.	YES	NO	TIME:
AS State Dept. of Environment	YES	NO	TIME:
Iceberg County Emergency Services	YES	NO	TIME:
Other (List)	YES	NO	TIME:
Other (List)	YES	NO	TIME:
Other (List)	YES	NO	TIME:

Table 2-2: Navigable Waters Potentially Affected		
Location	**Name or Type of Waters Affected**	**Distance**
On Installation	Daguao River, Ensenada Honda, Puerca Bay, various unnamed lagoons & mangroves	Immediately adjacent
Adjacent to Installation	Port Medio Munto, Atlantic Ocean, various lagoons & mangroves	Adjacent
Near Installation	Puerto del Rey	2500'

2.3 40 CFR 109.5(b)(2)

A current list of names, telephone numbers and addresses of the responsible persons and alternates on call to receive notification of an oil discharge as well as the names, telephone numbers and addresses of the organizations and agencies to be notified when an oil discharge is discovered.

2.3.1 Response to 40 CFR 109.5(b)(2)

Table 2-3 on the following page identifies the agency name and contact information that would be important in the event of a spill. It is important for the facility to review all names, addresses, contact numbers and other information on a regular basis to confirm that information is accurate and current.

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Table 2-3: Agency and Personnel Contact Information			
PRIORITIZED CONTACT LIST	**RESPONSE ROLE**	**DAY PHONE**	**24-HOUR PHONE**
On Facility Contact Information			
Facility Incident Commander Name: **Danial Kalal** Response Time: 0.5 hours	Incident command and control Facility Qualified Individual	(787) 534-0900	Not Available
Facility Response/Cleanup Team (BOSC) (Power Cooling & Controls)	Mitigate and Cleanup spills	(787) 272-5900	(787) 690-9898
NAPR Fire Department	Assist in the response & management of the incident	(787) 286-9139	(787) 865-4405
NAPR Dispatch	Facility Security Notification	(787) 534-0941	(787) 534-0941
Naval Facility Contact Information			
Commander Navy Region South East (CNRSE) Naval Air Station, Jacksonville Point of Contact: **Duty Officer** Response Time: Not available	Provide additional equipment and personnel resources	Not Provided	(904) 542-2338
Federal Response Agencies			
NATIONAL RESPONSE CENTER	Receiver of all spill reports and notifies appropriate FOSC	(800) 424-8802	(800) 424-8802
Response Contractors **NAVSUPSALV (Navy Supervisor of Salvage)** Point of Contact: **Duty Officer** Response Time: 16 hours	Provide additional equipment and personnel resources Provides response expertise	(202) 781-1731	(202) 781-3889
Response Contractors **USCG Marine Safety Office** Point of Contact: **Duty Officer** Response Time: 1.5-2 hours	Provide additional equipment and personnel resources As required	(787) 706-2444 (787) 289-2040	(787) 729-6800
Technical Support Point of Contact: **USCG National Strike Force Coordination Center (NSFCC)** Response Time: TBD	Coordination of USCG Strike Team's response equipment	(252) 331-6000	(252) 267-3458
Technical Support Point of Contact: **Gulf Strike Team (GST)** Response Time: TBD	Primary Strike Team for the Caribbean	(251) 441-6601	(251) 441-6601 (forwards to watch standard)
Private Response Contractors			
Local Response Contractors **Clean Caribbean & Americas** Point of Contact: Skip Przelomski or "On Call" Technical Advisor	Provide additional equipment and personnel:	(954) 983-9880	(305) 983-9880

Table 2-3: Agency and Personnel Contact Information			
PRIORITIZED CONTACT LIST	**RESPONSE ROLE**	**DAY PHONE**	**24-HOUR PHONE**
Red Caribeña de Varamientos (Caribbean Stranding Network) Point of Contact: Mr. Antonio Mignucci	Assistance with animal rehabilitation	(787) 759-8432	Not Available
Other Federal Agencies			
Federal Agencies **U.S. Fish and Wildlife Service** Caribbean Ecological Services Field Office, Boqueron, PR	Assistance with animal rehabilitation	(787) 851-7297	Not Available
DOD Agencies **U.S. Army Corps of Engineers Regulatory Section, Antilles** Point of Contact: Sindulfo Castillo, Chief- CE	Heavy Equipment	(787) 729-6905	(787) 729-6905
Reporting Agencies			
Local Emergency Planning Committee (LEPC) **Carolina LEPC, PR** Point of Contact: Enid Drevon	Incident Reporting	(787) 767-8181 Ext- 2253	Not Available
Local Emergency Planning Committee (LEPC) **Humacao LEPC, PR** Point of Contact: Brenda Rodriguez	Incident Reporting	(787) 285-2818	Not Available
Local Emergency Planning Committee (LEPC) **San Juan LEPC, PR** Point of Contact: Harold Alcover	Incident Reporting	(787) 767-8181 Ext- 2225	Not Available
State Environmental Regulatory Agency Point of Contact: **Puerto Rico Environmental Quality Board**	Incident reporting	(787)766-2823	Not Available
Federal Environmental Regulatory Agency Point of Contact: **Environmental Protection Agency - Caribbean Environmental Protection Division** Point of Contact: Carl-Axel Soderberg	Incident reporting	(787) 977-5870	Not Provided
State Emergency Response Commission (SERC) Point of Contact: **Puerto Rico Environmental Quality Board** Point of Contact: Enid Drevon	Incident reporting Emergency response	(787) 767-8181 Ext- 2253	Not Provided
Fire Departments			
Local (city/county) Response Team, Fire Department, HazMat Team **Cuerpo De Bomberos, Central Office, San Juan**	Emergency medical Haz Mat response support Fire suppression support	(787) 725-3444	(787) 725-3444

Table 2-3: Agency and Personnel Contact Information			
PRIORITIZED CONTACT LIST	**RESPONSE ROLE**	**DAY PHONE**	**24-HOUR PHONE**
Local (city/county) Response Team, Fire Department, HazMat Team **Cuerpo De Bomberos, Fajardo** Response Time: 0.5 hours	Emergency medical HazMat response support Fire suppression support	(787) 863-2330	(787) 863-2330
Local (city/county) Response Team, Fire Department, HazMat Team **Cuerpo De Bomberos, Ceiba** Response Time: 0.5 hours	Emergency medical HazMat response support Fire suppression support	(787) 885-2330	(787) 885-2330
Local (city/county) Response Team, Fire Department, HazMat Team **Cuerpo De Bomberos, Humacao** Response Time: 1 hour	Emergency medical HazMat response support Fire suppression support	(787) 852-2330	(787) 852-2330
Police Departments (911)			
Local Police Point of Contact: **Policia, Region de Fajardo**	Traffic control Evacuation Crowd control	(787) 889-1737 (787) 889-0909	(787) 889-1737 (787) 889-0909
Local Police Point of Contact: **Policia, Region de Humacao**	Traffic control Evacuation Crowd control	(787) 852-1224	(787) 852-1224
Emergency Broadcast Contacts			
Local Radio Point of Contact: **WDOY FM Fajardo**	Broadcast evacuation notices	(787) 723-9696	(787) 723-9696
Local Radio Point of Contact: **WUNO – NOTI UNO Broadcast Network, Metro**	Broadcast evacuation notices	(787) 758-7230	(787) 758-7230
Local Radio Point of Contact: **WOSO 1030AM, San Juan**	Broadcast evacuation notices	(787) 724-3940	(787) 724-3940
Local TV Point of Contact: **WAPA TV, San Juan, Channel 4**	Broadcast evacuation notices	(787) 792-4444	(787) 792-4444
Local TV Point of Contact: **WSTE-DT Channel 7 TV San Juan**	Broadcast evacuation notices	(787) 724-7777	(787) 724-7777
Weather			
Local Weather Point of Contact: **National Weather Service – San Juan**	Weather forecasts Public forecasts Marine forecasts	(787) 253-4588	(787) 253-4588

Table 2-3: Agency and Personnel Contact Information			
PRIORITIZED CONTACT LIST	**RESPONSE ROLE**	**DAY PHONE**	**24-HOUR PHONE**
Hospitals and Emergency Medical Services (911) **Note: Some hospitals may not be set up for in-house decontamination. Ensure field decon is performed prior to transport.**			
Hospital(s) Point of Contact: **HIMA- San Pablo, Fajardo**	Medical support	(787) 655-0505	(787) 655-0505
Hospital(s) Point of Contact: **UPR Carolina**	Medical support	(787) 757-1800	(787) 757-1800
Hospital(s) Point of Contact: **Metropolitan Hospital, San Juan**	Medical support	(787) 793-5013	(787) 793-5013
Hospital(s) Point of Contact: **Hospital Dr. Dominquez, Humacao**	Medical support	(787) 852-0505	(787) 852-0505
Hospital(s) Point of Contact: **Hospital Ryder Memorial, Humacao**	Medical support	(787) 852-0768	(787) 852-0768
Emergency Medical Services (EMS) Point of Contact: **Puerto Rico EMS, San Juan**	Medical support	(787) 765-1733	(787) 765-1733

2.4 <u>40 CFR 109.5(b)(3)</u>

Provisions for access to a reliable communications system for timely notification of an oil discharge and incorporation in the communications system of the capability for interconnection with the communications systems established under related oil removal contingency plans, particularly State and National plans.

2.4.1 Response to 40 CFR 109.5(b)(3)

Personnel located on the facility have access to and the ability to communicate by cellular and wireless telephones, hand held radio, and regular telephone systems during all hours. The dispatch center located in building number 1205 is manned 24 hours per day, 365 days per year. Access to fire, police and outside agencies is also readily available by multiple means of communications. Internet service is also available on the facility.

2.5 <u>40 CFR 109.5(b)(4)</u>

An established, prearranged procedure for requesting assistance during a major disaster or when the situation exceeds the response capability of State, local or regional authority.

2.5.1 Response to 40 CFR 109.5(b)(4)

In the event of oil spill that exceeds the capabilities of NAPR on-site personnel, including the Fire Department, Police Departments, and the BOSC personnel, the facility may contact a local environmental contractor and also notify local authorities as required. According to information obtained at the site visit, the local Police and Fire Department have in the past assisted the facility when requested as a professional courtesy though it was noted that the response time was delayed. The telephone numbers for the local municipal authorities are listed in Table 2-2. As noted above, depending on the nature of the incident and if local and State or regional authorities are unable to respond, the facility may request the services of a private contractor. Although no current contractual arrangement exits between the facility and a private contractor, it is possible that the facility may enter into such agreements in the future. Based on the resources available at the facility and the potential time delay from local and/or regional resources, NAPR should consider formalizing an arrangement for the services of a competent private environmental response company that would be able to effectively assist the facility if requested.

2.6 <u>40 CFR 109.5(c)(1)</u>

Provisions to assure that the full resource capability is known and can be committed during an oil discharge situation including:

The identification and inventory of applicable equipment, materials and supplies which are available locally and regionally.

2.6.1 Response to 40 CFR 109.5(c)(1)

The facility has various resources available to respond to oil spills located throughout the property as indicated below. At least one backhoe and two small motor boats are located on the facility and readily available if required. A complete inventory is recommended and should be conducted immediately to ensure that this section is accurate. In addition, all locations should be verified and updated on respective mapping. It was noted during the site visit that building 2036A contained the following general response materials; granular sorbents, absorbent booms, absorbent pads, 55-gallon drums, over pack drums, eye goggles, masks, hardhats, respirators, plastic bags and other types of response materials.

2.7 <u>40 CFR 109.5(c)(2)</u>

An estimate of the equipment, materials and supplies which would be required to remove the maximum oil discharge to be anticipated.

2.7.1 Response to 40 CFR 109.5(c)(2)

Based on the facility review, the estimated maximum oil discharge would be from a catastrophic failure from a substation located immediately across from Pier 2. This sub-station contains several thousand gallons of oil and due to its close proximity to the water would require immediate action on the part of the facility in order to minimize adverse environmental impact after discovery since the area currently has no form of secondary containment. The estimated equipment required to respond to this type of spill would include globe booms, absorbent pads, absorbent booms, granular sorbents, pillows, overpack drums, disposal bags, oil chemical resistant suits, goggles, hardhats, and other types of response materials.

In addition to this discharge scenario, other potential oil discharges are possible and should be considered due to the close proximity to water sources. These scenarios include:

- Pier 1 has an approximate 250 gallon transformer that is located immediately adjacent to the water and other transformers located throughout the facility are similar in that a spill from one could potentially enter the water rapidly.
- AFEES Marina transfers fuel immediately onto boats immediately adjacent to waterways by means of a single hose. In addition, two ASTs are located in this area and fueling operations also occurs.
- Transformers located throughout housing area that is near the water. Although many of these transformers do not contain significant volume of oil, their location requires vigilant safeguards.

The transformers located adjacent to waterways and all the transformers in general must be inspected on a regular basis as stated in the SPCC plan. An active inspection and maintenance program will document and ultimately prevent the transformers from further degradation by identifying which ones require immediate maintenance. In addition, consideration should be given to decommissioning transformers that are not required by removing the oil contents if feasible. In addition, pre packaged spill kits with the ability to contain a 250 gallon spill should be placed in close proximity so oil spills could be immediately addressed without having to locate materials and wasting time.

The AFEES Marina presents challenges since fuel is transferred with immediate proximity to the waterway. Since this presents a high risk location, it is recommended that a permanent globe boom of sufficient length be situated and utilized prior to commencing fueling operations. This booming would minimize accidental oil discharge at the marina from spreading beyond the immediate area and thus reducing spill costs. It is important to note that the boom must extend the entire distance around the fueling location since water is located under the concrete pier. In addition, it is recommended that the spill kits located at this area include but not be limited to an assortment of booms, pads, gloves and disposal barrels to contain waste material. In addition, it is recommended that the Marina encourage boaters to use fuel bibs or fuel collars to prevent overflows and prevent backsplash as well as have spill kits on the boats as well. Fueling operations at the Marina should include ensuring that the boats are not filled greater than 90 percent of capacity and to discourage top off. Also, fueling operation must be conducted with at least two personnel at the site: one person fueling the boat and the other at the dispenser observing the operation and with the ability to immediately shut down the pump. This procedure with regard to fueling would considerably reduce the potential volume of spilled fuel into the waterway. Lastly, the hose must be inspected on a regular basis to ensure that it is in good functional order and replaced if not.

The transformers located throughout the facility must be inspected on a regular basis and a maintenance program implemented as noted above.

2.8 40 CFR 109.5(c)(3)

Development of agreements and arrangements in advance of an oil discharge for the acquisition of equipment, materials and supplies to be used in responding to such a discharge.

2.8.1 Response to 40 CFR 109.5(c)(3)

NAPR does not currently have any external written agreements in place with a private contractor at the time of this writing to assist in oil discharge that is beyond the capability of the facilities expertise (BOSC and NAPR Fire Department). In the event of a release that may exceed the facility's capability to respond, the facility would need to contact a local competent environmental contractor in an expeditious manner. Although it is not anticipated that such services are required, as a precautionary measure, it is recommended that the facility consider an agreement with a local private environmental contractor as a safety measure. As indicated in Figure 1-2 in Appendix B of the SPCC Plan, the facility has several locations where spill equipment is maintained. The types of material stowed at these facilities is typical of spill response items including but not limited to drums, over pack drums, absorbent pads, booms, blankets, hardhats, goggles, ect. In addition, the facility has two small boats at its disposal to aide in the deployment of booms if required.

2.9 40 CFR 109.5(d)(1)

Provisions for well defined and specific actions to be taken after discovery and notification of an oil discharge including:

Specifications of an oil discharge response operating team consisting of trained, prepared and available operating personnel.

2.9.1 Response to 40 CFR 109.5(d)(1)

The Base Operational Services Contractor (BOSC) and NAPR Fire Department are the primary teams responsible for oil discharges. According to Mr. Louis Medina, Lead Firefighter, the department conducts training on a regular basis to include oil spills from vehicles and similar types of accidents. The Fire Department has trained personnel capable of responding to emergencies 24 hours a day 365 days a year, and consists of a total of six fire fighters, three fire fighters per twelve hour shift. Mr. Louis Medina is responsible for the training content and evaluation of the Fire Department personnel. The BOSC, Power Cooling Inc. also has Occupational Safety and Health Administration (OSHA) trained personnel who are capable of responding to oil spills. It is recommended that all responders have at a minimum OSHA 40 hour health and safety training (HAZWOPER) in accordance with 29 CFR 1919.120. This training should be updated annually. In addition, all personnel who work with or have the potential to be involved with POL are required to have SPCC training.

Following a response to an oil discharge, a through review of the actions taken is required to be conducted to identify areas where improvements are possible. A briefing will be conducted with field personnel, contractors and other responders to discuss lessons learned for subsequent inclusion in the SPCC training seminars and other exercises. If required, the Contingency Plan will be amended to reflect changes made to the facility and or procedures.

2.10 40 CFR 109.5(d)(2)

Predestination of a properly qualified oil discharge response coordinator who is charged with the responsibility and delegated commensurate authority for directing and coordinating response operations and who knows how to request assistance from Federal authorities operating under existing national and regional contingency plans.

2.10.1 Response to 40 CFR 109.5(d)(2)

The Area Program Director of the facility is charged with the responsibility and authority to request assistance from local, state and federal authorities.

2.11 40 CFR 109.5(d)(3)

A preplanned location for an oil discharge response operations center and a reliable communications system for directing the coordinated overall response operations.

2.11.1 Response to 40 CFR 109.5(d)(3)

Building 1205 would act as the response operations center. This building currently houses the NAPR police force and is centrally located. In addition, the Area Program Director is located on the second floor and would be in a position to request outside assistance if required. The fire department would also have a representative present at this location if such a person where available and not engaged in the response operation as well as consult with the Area Program Manager.

2.12 40 CFR 109.5(d)(4)

Provisions for varying degrees of response effort depending on the severity of the oil discharge.

2.12.1 Response to 40 CFR 109.5(d)(3)

Based on the limited POL capacity storage at the facility, it is anticipated that all spills on land and adjacent to the water should be able to be handled by the response personnel. The NAPR Fire Department conducts regular spill training evolutions throughout the year and the BOSC contractor has available personnel resources to supplement the Fire Department if required. As previously noted, consideration should be given to the possibility of having an environmental response contractor available as an additional precaution.

2.13 40 CFR 109.5(d)(5)

Specifications of the order of priority in which the various water uses are to be protected where more than one water use may be adversely affected as a result of an oil discharge and where response operations may not be adequate to protect all uses.

2.13.1 Response to 40 CFR 109.5(d)(5)

It is critical that every effort be made to protect all the waterways located at NAPR from oil spills to the maximum extent possible. To that end, considerable logistical issues must be in place prior to an accidental oil discharge. Having spill response equipment strategically located and immediately available as well as properly trained personnel able to expeditiously and safely respond to a spill is paramount and a requirement for compliance with this CP. For these reasons, it is critical that the recommendations stated in the SPCC Plan, namely monthly inspections of oil containing transformers and ASTs be implemented and effectively managed. This aggressive inspection and maintenance plan will mitigate the possibility of any spills occurring and reduce the possibility of prioritizing waterways at NAPR. Since NAPR does have several locations where spill equipment is located, the facility should be able to adequately respond to spills and significantly reduce the possibility of oil from entering into any waterways providing the recommendation stated in the SPCC Plan and this CP are implemented.

2.14 <u>40 CFR 109.5(e)</u>

Specific and well defined procedures to facilitate recovery of damages and enforcement measures as provided for by State and local statutes and ordinances.

2.14.1 Response to 40 CFR 109.5(e)

NAPR is a military installation controlled by the United States Navy. The United States Navy has procedures in place through its legal system to facilitate the recovery of damages as well as ensuring compliance with enforcement measures by State and local statues. The United States Navy will cooperate to the fullest extent with all applicable Federal, State and local laws and regulations.